The effects of social comparison information on cancer survivors' quality of life

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A field-experimental intervention approach

Thecla Brakel

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General introduction

Thecla M. Brakel

General introduction

Cancer is one of the most significant causes of death. In 2010, one out of three deaths in the Netherlands were caused by cancer (CBS, 2011). The chance of developing cancer at least once during one's lifetime is high. In the US, about one out of two males and one out of three females will develop cancer (ACS, 2010). In 2008, 12.7 million cases of cancer have been reported worldwide, resulting in 7.6 million deaths (Ferlay et al., 2008). The number of cancer-related deaths per year is expected to continue to increase to a roughly 13.1 million in 2030 (Ferlay et al., 2008).

While the prevalence of cancer is increasing, fortunately, nowadays more and more people survive cancer. The risk of dying from cancer has been on the decline for several decades in the Netherlands now (CBS, 2011). Data from 1999 to 2005 show that the cancer survival rate – still being alive five years after the diagnosis of cancer – in the US was approximately 68 % (ACS, 2010). This is a rise of 18 % compared to the timespan of 1975 to 1977. Partly responsible for this higher survival rate, is the earlier detection of cancer and the correspondingly smaller tumor size when diagnosed. Additionally, treatments have become more effective (Jemal, Ward, Hao, & Thun, 2005; Verdecchia et al., 2007).

Due to the higher survival rate, more patients go through a process of recovery after their successful treatment. In 2008, for instance, there were 11.9 million cancer survivors in the US, which was approximately 4% of the population (Howlader et al., 2011). Worldwide, numerous cancer survivors are dealing with recovery from cancer while trying to cope with cancer-related problems, such as fear of cancer recurrence (Lee-Jones, Humphris, Dixon, & Hatcher, 1997; Stanton, et al., 2005; Thomas, Glynne-Jones, Chait, & Marks, 1997), uncertainty about the future (Lee-Jones et al., 1997), one's new role in society, future planning (Humphris & Ozakinci, 2008), changes in (physical) identity, concerns about finances, sexual worry (Park et al., 2007), sexual disinterest (Ganz et al., 1996), as well as pain, and fatigue (Meeske et al., 2007). The current work (dissertation) focuses on the situation of cancer survivors who are presently in this recovery phase (i.e., patients who have finished a successful treatment in the hospital).

From a psychological point of view, this recovery phase is not without problems. One of the characteristics of this phase is that cancer survivors are no longer in close contact with health care professionals, even though they may still have difficulties in their psychological, physical, and social functioning, while having to cope with physical ailments. In many respects, the recovery phase challenges the *quality of life* of cancer survivors, making it important to provide former cancer patients with the appropriate aftercare. The main focus of the current work is on the quality of life of cancer survivors and how this can be influenced by social comparison information in the aftercare. In the present context, social comparison refers to cancer survivors comparing themselves to (information from or about) fellow cancer survivors. The aim of this thesis was to test the effects of different social comparison information interventions on subjective quality of life and to understand the processes that were responsible for these effects. It is studied what the effect of social comparison information is on the quality of life of cancer survivors and whether individual differences of cancer survivors moderate these effects. This new knowledge

can be used in an intervention in which information is adapted to specific individual differences. Thus, the current project aims to develop new patient education information to improve cancer survivors' quality of life and to test the efficacy of such information in increasing quality of life.

Quality of Life

Quality of life is an abstract, multidimensional concept (Taylor, Gibson, & Franck, 2008). It is used in different disciplines and has multiple meanings. Even within the health care domain, quality of life is conceptualized in many different ways and is often poorly defined (Haas, 1999). Two important ideas of quality of life in the health care domain can be distinguished: 1) health-related quality of life and 2) subjective quality of life. Both types of quality of life are relevant and important in that they refer to two core aspects of any human being: functioning and experiencing.

Health-related quality of life. The concept of *health-related quality of life* reflects, more or less, the objective functioning of an individual. The focus is on functioning in the physical, role, cognitive, emotional, and social domains and on symptoms, such as, fatigue, pain, and nausea. Physical functions can be assessed relatively objectively, for instance, cardiovascular and motoric functions can be assessed in terms of blood pressure and muscle power, respectively. Similarly, employment is a function in the societal domain that can also be assessed objectively by rating the hours of paid work of an individual. Changes in health-related quality of life occur when functions change, for example, due to a medical treatment (e.g., anti-hypertensive treatment), or to changes in societal roles (e.g., finding or losing a job), or to increased social activity (e.g., becoming a member of a club). The health-related quality of life of a cancer survivor is a measure of how the individual is functioning, whether this is relatively well or poor. This may be important for social comparisons because it is a starting point from where the cancer survivor compares with fellow patients. Compared to the own functioning others may seem to function relatively better or worse.

Subjective quality of life. Whereas health-related quality of life assesses different functions, the subjective quality of life reflects the patient's perception of how he or she is doing overall (Muldoon, Barger, Flory, & Manuck, 1998; Stenner, Cooper & Skevington, 2003). The subjective quality of life is a global measurement on the basis of an individual's personal appraisal of how someone is doing, feeling, and functioning in life in general. In this appraisal, the relevance of different issues that play a role in the physical, psychological and social functioning can be taken into account. In this global measurement of quality of life the importance that different functions have for the individual, is taken into account. Changes in subjective quality of life can be caused by changes in objective functioning, but independently, also by changes in the meaning given to functions.

In short, health-related quality of life is a more objective, concrete measure whereas subjective quality of life is subjective and abstract. There is little room for interpretations in health-related quality of life as it only changes when functions change. Health-related quality of

life can, for example, decrease because the illness caused individuals to lose their job. In contrast, subjective quality of life can also change when the meaning of functions changes. Subjective quality of life can increase, for example, despite an individual losing her job: The individual may realize that family contact is important in this phase of the illness, and that there is more time now to meet them. Both types of quality of life are relevant and important in that they refer to two core aspects of any human being: functioning and experiencing, respectively.

Health-related quality of life can be best targeted with interventions that change the functions, for instance, by subscribing effective medication. Subjective quality of life becomes more important when no change in functions is possible anymore. For former cancer patients who have finished their main medical treatment, provision with social comparison information seems an appropriate intervention because it could help to create a positive meaning about the personal functioning. In the current thesis the focus is especially on this group of patients of whom it is expected that their *subjective quality of life* can be increased by a psychosocial intervention, more specifically a social comparison intervention.

Changes in subjective quality of life. When a person's quality of life is compromised, this person will mostly take action to improve his or her quality of life. With regard to subjective quality of life this means that he or she may engage in changing the perception of reality. People have various mechanisms at their disposal to perceive their situation in such a way that it generates less negative affect and increases subjective quality of life. People may, for example, selectively attend to aspects of their situation, incorporating positive information and discarding contradictory, negative, or ambiguous information (Nickerson, 1998). Individuals can also distort the interpretation of meaning or memory-recall, or use enhancing illusions (Taylor & Brown, 1988). Cancer survivors can, for instance, overestimate their own chances to experience positive events ("Although the doctor said my cancer is incurable, I know I will survive cancer"). They may, on the other hand, underestimate their chance to experience negative events compared to other cancer survivors' chances ("Although a lot of cancer patients die, I am sure I will not die because of cancer"). In addition, people can construe an illusion of control over things that are uncontrollable (Langer, 1975), for example, cancer patients might convince themselves that positive thinking will lead to survival (Aspinwall & Tedeschi, 2010). Another mechanism that has been studied specifically in the context of cancer patients is the response shift (Breetvelt & Van Dam, 1991). A response shift is a fundamental change in perception, not caused by a change in one's situation, but through a change in the internal standard (recalibration), a change in internal values (in which the order of concepts is validated anew; reprioritization), or a change in the meaning of, or view on a concept (reconceptualization; Sprangers & Schwartz, 1999). Other related constructs and mechanisms that help to construe the perception of one's situation in a desirable way are, for instance, unrealistic optimism (Shepperd, Klein, Waters, & Weinstein, 2013), motivated inference (Kunda, 1987), stoicism (Moore, Grime, Campbell, & Richardson, 2013), cognitive dissonance reduction (Festinger, 1957), denial (Vos & de Haes, 2007; Vos, Putter, van Houwelingen, & de Haes, 2008), and appraisal coping (Schlatter & Cameron, 2010).

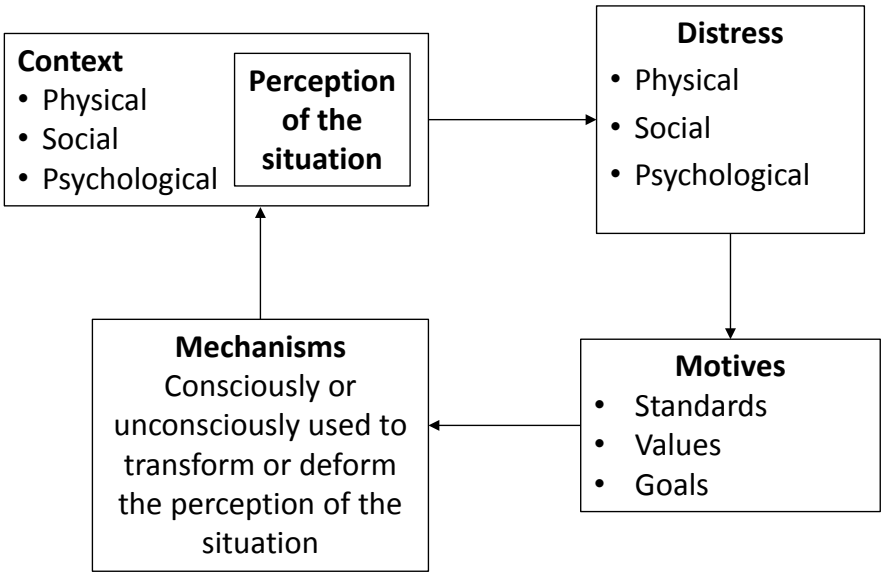

Figure 1. A cybernetic model of maintenance of subjective quality of life.

By using such mechanisms individuals can change the perception of the meaning of different aspects of their lives themselves. From a strictly psychological point of view, individuals interpret the *situation* they live in, including their physical being and functioning (Figure 1). When the situation is perceived as negative (compared to an *internal standard* on what is desired), subjective quality of life drops, possibly motivating the individual to change its perception: Psychological mechanisms are activated to self-regulate subjective quality of life into a more positive direction, according to the *internal standard*. By using these mechanisms consciously or unconsciously the perception of one's situation can become transformed or deformed, and a more desirable subjective quality of life may be constructed.

Perception of one's situation. How patients experience their situation depends on how they perceive their reality (i.e., how they psychologically construct their situation). Many perspectives are available to an individual that can be used to provide a different meaning to a certain situation. Imagine the situation of a patient who can walk up to 500 meters and then has to sit down to rest. This situation can be perceived in different ways by the patient, depending on what aspects are considered the most important by the patient. The patient might find walking, for instance, less or more important in life. The patient may focus either on still being able to walk, on not being able to walk so far anymore, or on one's perseverance to still walk for 500 meters. Another aspect of the situation that the patient might highlight is comparing the ability to walk 500 meters with how far other people can walk. This last example being one special mechanism or strategy to construct and to change one's perception of one's situation: comparative thinking.

Comparative thinking and the perception of one's situation. The meaning of a patient's situation is relative; it depends on what it is compared with. Three basic forms of comparative thinking can be distinguished, each related to different types of comparison: 1) temporal comparison, 2) counterfactual comparison, and 3) social comparison. With temporal comparison, an individual compares one's current state with a state at a different point of time, such as one's past state (Albert, 1977; Schwartz & Sprangers, 1999). Counterfactual comparison concerns the comparison of one's present state to how this state might have been, had things gone differently (Epstude & Roese, 2008; Gilbar & Hevroni, 2007; Roese, 1994). Lastly, in social comparison, a person compares his or her own situation with another person's situation (Buunk & Gibbons, 2006; Suls, Martin, & Wheeler, 2002). This last psychological mechanism, social comparison, is of special interest in the current work as it is the conceptual foundation for the interventions that have been developed and applied in this study to influence the cancer patients' subjective quality of life. Thus, these interventions make use of a psychological mechanism, social comparison, that is related to changing one's perceptions of one's situation to increase subjective quality of life.

Social Comparison

Social comparison is the comparison of one's own state with the state of one or more other individuals. It is a common psychological process, often operating subconsciously. In social comparison, people compare themselves with others on objective aspects – like wealth, length, or hair color – and on more subjective aspects like sincerity, trustworthiness, or patience. Cancer patients can compare themselves with actual others in the waiting room of the hospital or mentally build an image of other cancer patients. In one interview, for example, a breast cancer patient spoke of an image she had construed about the partners of women who were in the same situation as she was: "All these women who are left by their husbands. The bastards. Many men just leave their wives, just now when they need their support the most. My husband still loves me, despite the fact that I have lost my breast. I think that I am very lucky…" (Van der Zee, 1996). The psychological process of comparing oneself with other breast cancer patients who were so poor off, probably helped this particular breast cancer patient to feel better about her situation. It is likely that individuals are motivated to employ social comparisons to affect their own quality of life in a positive direction.

The underlying motives for social comparison. There are different motives that cancer patients can use, like self-evaluation, self-improvement and self-enhancement. In general, a motive is a drive to accomplish a goal or to fulfill a basic need, for instance, to reduce (psychological) pain or to increase pleasure. Motives ensure that people adapt to their surrounding world. Such an adaptation can take place after self-evaluation; individuals can become motivated to compare their own abilities, opinions, experiences, and feelings, with those of others (Festinger, 1954; Wood, Taylor, Lichtman, 1985). Social comparison information, is information about others

who are in the same situation as the individual (Suls, et al., 2002). People who are confronted with a serious health threat tend to compare themselves with others facing a similar threat (Buunk, Gibbons, & Reis-Bergan, 1997; Schachter, 1959; Tennen, McKee, Affleck, 2000). A cancer survivor who finished treatment in a hospital may want to make a self-evaluation about specific cancer related concerns and may want to look for answers to the following questions: "Is it normal that I am so tired, that I can no longer walk to the nearby store, and that I feel fear for the recurrence of cancer?"

Another motive is self-improvement which can arise when someone wants to know how one's own circumstances or abilities can be changed for the better (Wood, 1989). When a breast cancer survivor wants to learn how to cope with the new situation while no objective guidelines are present to give meaning to this unfamiliar situation (Buunk & Gibbons 2006, Festinger, 1954), this patient can turn to others for vicarious learning (Bandura, 1986). One cancer patient, for instance, mentioned the following in an interview: "The woman with breast cancer lying next to me in the hospital was a real fighter. She coped very well. She was joking all the time and she just showed her wound without embarrassment, she was a real example for me…" (van der Zee, 1996). Self-improvement is best accomplished by looking for others who, under examination, do better within the same situation (Collins, 1996).

Another motive is the motive of self-enhancement which can arise when people feel uncertain, especially those who perceive their own physical health as negative after evaluation (Bennenbroek, Buunk, Van der Zee, & Grol, 2002). People may search for others who seem worse off to reduce the uncertainty and to feel better about one's own situation. To accomplish this, a patient may, for instance, use a downward comparison such as the following: "I met a cancer survivor who long ago lost both her breasts and her axillary nodes. I lost only one breast, so I am sure that I will survive, because she also did". Thus, there are several motives to make social comparisons that could be salient, which can also be recognized in former cancer patients using social comparison. The motives have in common that they aim to make the situation more bearable.

Social comparison in former cancer patients. The recovery phase which is a novel situation for almost all cancer patients, is often hard to handle. In addition, former cancer patients usually do not have objective guidelines on how to give meaning to their new situation. This may lead to feelings of uncertainty, and may consequently motivate them to evaluate their new context in order to search for relevant information from other cancer patients (Bennenbroek et al., 2002). In general, cancer patients often report that the information they receive from fellow patients is unique and that only fellow patients can understand what they are going through (Gray, Fitch, Davis, & Phillips, 1997). As such, comparisons with other cancer patients can be an important source of interesting, useful, and meaningful information during the recovery phase (Buunk et al., 2009; Festinger, 1954, Van der Zee, Oldersma, Buunk, & Bos, 1998). Social comparison, however, does not always help people to feel better and does not always lead to a higher quality of life. There are, for instance, people who experience chronic stress, who are interested and open to social comparison information, but who nevertheless end up feeling depressed (Buunk & Gibbons, 2006). It thus seems that individuals differ in the way

they process social comparison information (Buunk et al., 2009). Therefore, it is important to focus on the individual differences between former cancer patients, specifically those differences that are related to different reactions to social comparison information. On theoretical grounds, Taylor et al. (2007) already anticipated possible negative effects of social comparisons for cancer patients, based on individual differences. In the next paragraphs, the focus will be on individual differences that could be responsible for different reactions to social comparison information.

Social comparison direction. Social comparisons can be made in an upward direction (with more fortunate others) or in a downward direction (with less fortunate others). Upward comparison may lead to positive feelings when patients focus on the similarities between themselves and the comparison other and *identify* with the comparison other. The identifying patient may consequently think that improvement is possible and that he or she may become more like the comparison other in a positive sense in the future (Stanton, Danoff-Burg, Cameron, Snider, & Kirk, 1999; Taylor, Aspinwall, Giuliano, Dakof, & Reardon, 1993; Taylor & Lobel, 1989): "This other patient had throat cancer, just like me, and has recovered quickly. I probably will recover quickly too". The fact that a similar other recovered quickly can fill the patient with hope to experience a similar outcome. As a consequence quality of life can increase (Buunk et al., 1990).

Upward comparison can, however, also be threatening and may lead to negative consequences when the patient does not identify, but *contrasts* upward instead. In this case, the focus of the patient is on the differences between oneself and the other. Consequently, the patient may feel different and/or inferior compared to the comparison other (Aspinwall & Taylor, 1993; Buunk et al., 1990): "This other cancer patient has recovered quickly, but she did not have a breast amputation like I had. I probably need a longer time to recover because of that". It may be threatening to notice that one's own state is inferior to another's state, may be threatening. As a consequence, quality of life can decrease.

Downward comparison can improve well-being when the patient *contrasts* and focuses on differences, particularly in a situation in which patients see no opportunity to change their situation (Wills, 1981). The patient feels better by comparing downward with a patient who is worse off (Buunk et al., 1990; Gibbons, 1986; Gibbons & Gerrard, 1991; Stanton et al., 1999; Taylor, Wood, & Lichtman, 1983; Van der Zee et al., 1996; Wills, 1981; Wood, et al., 1985): "This other cancer patient has both breasts and lymph nodes removed. I am lucky because I had only radiation therapy and did not need surgery to cure my breast cancer". To notice that oneself seems better off can create hope for a better outcome. As a consequence, quality of life can increase.

Downward comparison may lead to negative consequences when a patient *identifies* with the other who is worse off. The patient feels similar and focuses on the possibility of deteriorating as well (Buunk & Ybema, 1997; Van Oudenhoven-van der Zee, Buunk, Sanderman, Botke, & van den Bergh, 1999): "Although I had only radiation therapy this time, it may be that the cancer comes back and that both my breasts and lymph nodes will have to be removed, like it happened to this other patient". Confrontation with a cancer patient like this can evoke fear ending up in a similar manner. As a consequence quality of life can decrease.

It seems the best possible outcome arises when the patients who make use of contrasting processes, would compare themselves downward, and when patients who use identification processes, would compare themselves upward. There are, however, constraints to the extent to which individuals can compare themselves upward or downward.

The constraint effect of social comparison. Social comparison processes can be self-regulated to make the desired upward or downward comparison (Buunk & Ybema, 1997; Taylor, Buunk, & Aspinwall, 1990; Taylor & Lobel, 1989; Taylor, et al., 1983; Wood, 1989). Patients may, for example, look for dimensions on which the comparison-other is worse off in order to enhance themselves, and ignore parts of the information that are unfavorable. Reality, however, puts constraints on the extent to which individuals can shift the position of the comparison-other in an upward or downward direction. When the patient self is doing well undeniably ("up"), it is not easy to shift the position of a social comparison-other in an even more upward direction for comparison. When patients are doing extremely well according to their own perception, most comparisons with others will be perceived as downward comparisons. In a similar manner, when the patient self is undeniably "down", it is not easy to shift the position of a social comparison-other in a downward direction. Thus, when patients are doing extremely poor according to their own perception, most comparison others will be perceived as upward targets. This constraint effect on social comparison may determine how the position of the comparison other is perceived and whether the patient engages in (mostly) upward, or downward comparison (Buunk & Gibbons, 2007). For cancer patients, the constraint effect is likely caused by the patient's physical state.

Cancer patients differ from each other in terms of their objective physical functioning and their physical health, for example, in illness-specific symptoms or handicaps (e.g., lymph node removal in the armpit to treat breast cancer can have several side effects: loss of tactile functions, nerve pain, restricted range of motion, and lymphedema). From the perspective of the physician, the state of objective functions helps to determine a proper treatment plan. Patients, however, have their own perspective on their physical functioning and their physical health. In assessing their physical functioning they are expected to include objective aspects (e.g., "Last week I vomited two times.") and less objective aspects (e.g., "I was limited by my physical health last week."). When estimating one's own perceived physical health, subjective evaluations are involved (Tesser, Millar, & Moore, 1988; Wood, 1989; Wood, et al., 1985). Patients can use mechanisms such as unrealistic optimism and illusory superiority, although, with regard to concrete health-related functions, there is limited space to construe reality. The self-perceived health status is the cancer patient's basis for comparing him or herself with others and it places constraints on the social comparisons that can be made, whether patients will experience a certain social comparison-target as being more "up" or more "down". This individual difference in perceived physical health between cancer patients is therefore expected to moderate social comparison outcomes. Another individual difference known to moderate the social comparison outcome, is social comparison orientation.

Social comparison orientation. Physical health is not the only individual difference that determines how a person processes and receives social comparison information. Stable and

chronic differences exist between people in their preferences for social comparison information and how they prefer to process this information. A well-documented individual difference is one's Social Comparison Orientation (SCO), which is measured with the Iowa Netherlands Comparison Orientation Scale (INCOM; Gibbons & Buunk, 1999). SCO refers to the self-reported extent to which someone compares him or herself with others, and the frequency with which this is done (Gibbons & Buunk, 1999). This individual difference is known to influence reactions to social comparison information (Buunk, Van der Zee, & Van Yperen, 2001). People who score high on SCO look more frequently at others' accomplishments, experiences or reactions to the situations, and relate this more intensively to themselves (Buunk and Gibbons 2006). In general, individuals who score high on SCO are uncertain and highly aware of themselves, interested in what others feel and think, and how they themselves can conform to those others. They engage more in both downward as well as upward social comparisons, and pay more attention to, and spend more time on available social comparison information (White, Langer, Yariv, and Welch, 2006). In addition, Buunk and Gibbons (2006) have found that the personal risk perception and the interpersonal relational future of individuals with a high level of SCO are mostly to a greater extent based on comparisons with others than those of individuals with a low level of SCO.

Research has shown that the level of SCO in individuals can be responsible for a change in mood after social comparison, depending on their level of burnout (Buunk, Ybema, Gibbons, & Ipenburg, 2001), level of neuroticism (Buunk, et al., 2001), or on how depressed they were (Buunk & Brenninkmeijer, 2001). These individuals had in common that they displayed a strong sensitivity towards social comparison information: They showed more extreme reactions to social comparison information. The magnitude of affective reactions to social comparisons might be seen as a central indicator of sensitivity. Given its operationalization, SCO seems an indirect measure of this affective reactivity.

In the current thesis I am also interested in cancer patients' sensitivity to social comparison information, as a greater sensitivity could exert a stronger or different effect of comparisons on the quality of life of patients. Therefore, another more direct measure of the affectivity of the reactions will be applied. The scale that was used for this purpose, was originally developed as the Identification-Contrast scale, and was tested with cancer patients (Van der Zee, et al., 1999; Dibb & Yardley, 2006). In this thesis, the total scale has been re-conceptualized to assess people's Social Comparison Sensitivity (SCS). One typical example of an item that was used in the 12-items scale is: "When I think about others who are better off, I feel frustrated about my own situation." All 12 items assess the extent of affective reactions to social comparison. With measured levels of SCO and SCS it becomes possible to study whether both moderators have distinct effects on the responses to social comparison information, although they might be correlated. They both are more or less indirect measures of the underlying sensitivity to social comparison information. SCS, however, seems a relatively more direct measure of sensitivity to social comparisons. SCS and SCO seem to measure different aspects of social comparison: SCS measures affect that individuals experiences after different kinds of social

comparisons and SCO measures frequency of and the extent of making social comparisons. Individual differences in sensitivity are reported in the literature, of which some examples are presented below.

Sensitivity to social comparisons. In the study on former cancer patients (as described in this thesis), differences in sensitivity to social comparison are thought to be important. First, I assume that social comparison information from other cancer patients is not neutral. This kind of information is believed to confront recovering patients with their (current) situation in which they may fear the recurrence of the cancer, may be coping with cancer-related problems, and may feel uncertain about the future, with all its accompanying emotions. Therefore, the social comparison information will most likely cause affective reactions, especially in individuals with a high sensitivity to social comparisons. Second, I assume that these patients, as argued above, are particularly motivated to construe their reality, because they want to down-regulate negative affect.

Individuals who are sensitive to social comparisons, strongly and vividly relate themselves and their own position to the individual that they compare themselves with. They are sensitive to another's triumphs or failures where other individuals seem indifferent (Lyubomirsky, Tucker, & Kasri, 2001). They also have a heightened self-awareness, which not only results in a greater reliance on social standards for self-evaluations (Diener & Srull, 1979), but in an intensified affective responsiveness in general as well (Hoberman & Lewinsohn, 1985). In addition, sensitive people have less firm beliefs about their competence or abilities and are relatively uncertain (Lyubomirsky et al., 2001; Campbell, 1990; Kernis, Cornell, Sun, Berry, & Harlow, 1993; Weary, Elbin, & Hill, 1987).

Depressed participants seem sensitive to social comparison information (McFarland & Miller, 1994; Swallow & Kuiper, 1988). Social comparison information has a stronger effect on unhappy and depressed individuals and they contrast their accomplishments with that of an outperforming comparison other, whereas happy students adapt to their ability rating to the position of the outperforming comparison other (Lyubomirsky & Ross, 1997). Furthermore, downward comparisons seem to have little effect on non-depressed participants, whereas these kinds of comparisons improve the mood states of depressed participants (Gibbons, 1986). In addition, in research people were identified who are sensitive to all social comparison information (Lyubomirsky et al., 2001) and who especially use contrasting techniques. After upward comparison, they express greater doubts about their own abilities, and their positive mood decreases. After downward comparison, their mood improves, and their self-esteem increases (Lyubomirsky et al., 2001). Another line of research suggests that uncertain people have an increased sensitivity to social comparison information and that it has a greater effect on their self-evaluations (Weary, et al., 1987).

Thus, sensitive individuals seem interested in social comparisons, experience a greater affective response after comparison, and respond more often with reactivity, which may influence their mood and how they evaluate themselves. In this thesis, SCO and SCS will be used as indirect measures of individual differences in sensitivity that may moderate the effects of social comparison information. Besides sensitivity as a moderator for social comparison information, the patient's perception of his or her illness will be studied as a moderator.

Illness perception as a moderator. While social comparison information can support a patient's attempt to psychologically construct a bearable reality, not all patients may benefit from it to the same degree. Patients who already have managed to construe a bearable perspective on reality may not need such information. In contrast, patients who have been less successful in shaping their perception on reality, may benefit from exposure to social comparison information. For (former) cancer patients, one core construction of reality concerns the psychological construction of their illness, which is in the literature usually referred to as illness representations.

Illness representations are perceptual constructions of the reality of one's own illness. These mental representations of illness are multidimensional (Coutu et al., 2008). The common sense model of mental representations of illness (Leventhal, Meyer, & Nerenz, 1980), for instance, incorporates five cognitive dimensions. The first one is the *identity of the illness*, which is based on associations that are held about the illness and its corresponding symptoms. The second dimension concerns the *causes of the illness*. This perception refers to factors that contribute(d) to the illness. The third dimension includes the *consequences of the illness*, which refers to beliefs about the severity of the illness. The fourth dimension is the *timeline of the illness*, referring to the illness being *acute/chronic* or *cyclical*. The fifth dimension is the *perceived controllability of the illness*.

Individual differences in illness representations may lead to differences in how patients experience their illness, and therefore, may have consequences for their subjective quality of life (Aalto et al., 2006; Kesler, Kliper, Goner-Shilo, & Benyamini, 2009; Scharloo et al., 2007), in particular the evaluation of one's physical, social, and psychological life-domains (Leventhal & Colman, 1997; Scharloo et al., 2007). A negative and pessimistic illness representation is, for an important part, responsible for anxiety, psychological distress, and depression (Dempster et al., 2010; Kesler et al., 2009). Illness representations are, yet, not necessarily stable and objective (Kesler et al., 2009). They are susceptible to biases and easily influenced by psychological mechanisms like optimism (Taylor & Brown, 1988) and catastrophic cognitions (Sullivan et al., 2001), as well as by contextual changes, time, social processes (Coutu et al., 2008), and affective states (Petersen, van den Berg, Janssens, & Van den Bergh, 2011). Thus, illness representations can be influenced by many factors. When changes in illness representation occur, this may subsequently have an effect on a patient's subjective quality of life.

In the current project, the focus lies on two aspects of illness representation that were most important in two validation studies (Giannousi, Manaras, Georgoulias, & Samonis, 2010; Wittkowski, Richards, Williams, & Main, 2008). The first aspect refers to the perceived severity of the illness and the emotional response to this perception. This factor is emotional in nature and is a representation of how life-threatening the illness seems to the patient at a certain moment and what the consequences of the illness are. It is considered to represent the perceived life threat *at present*. The second aspect refers to the timeline, to beliefs about how chronic the illness will relatively be. This refers to how patients expect their illness or health to change over time. This factor is a representation of *future* health: The expectation a patient has about his or her health in the future.

Both representations may serve a patient's basic motive to feel better about his or her often complex and uncertain situation. When the illness representations are positive, we assume that this is for functional reasons: Patients have gathered and endorsed information that helps them to feel better. Thus, these patients have succeeded to construct a representation of their illness that benefits them emotionally, and this possibly spreads out to other domains (e.g., social and physical). For these patients, social comparison information may have little benefit. It may add only a little to their own definitions and representations of their reality. In contrast, when illness representations are negative, we assume that patients have not succeeded in constructing a more bearable reality. These patients in particular may benefit from social comparison information as a means of shaping a more positive representation of their reality.

The social comparison interventions. The social comparison interventions that have been developed for the studies that are described in this thesis, are based on the aforementioned theoretical perspectives. All interventions were especially developed for these studies. In this section, I will describe how these interventions were developed and what channel, method, and strategies were selected (see figure 2).

To design an effective social comparison intervention aiming to enhance quality of life, the *HELP* framework was used. In the HELP framework for intervention development (Dijkstra & Buunk, 2008), five basic elements must be specified: the channel, the method, the strategy,

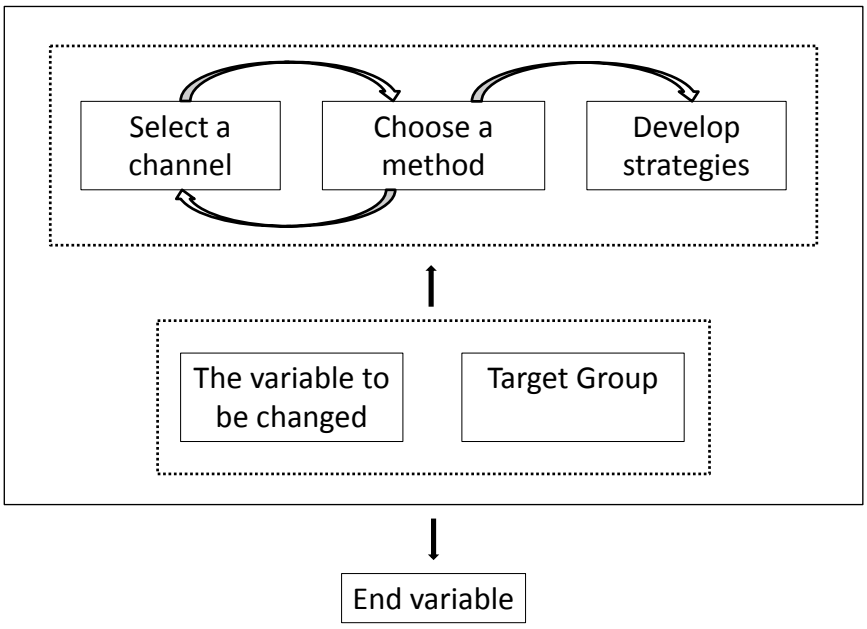

Figure 2. Developing the intervention based on the HELP framework (Buunk & Van Vught, 2008): selecting a channel, a method, and strategies, given the variable to be changed, the given target group, and the end variable(s) (Dijkstra & Buunk, 2008).

the variables to be changed, and the target group. Next to specifying the basic elements, the end variable must be defined. The target group (former cancer patients) and the end variable (quality of life) had already been determined. The variable to be changed concerned the social comparisons made by former cancer patients and the method to change this variable was to present social comparison information. The intervention was the result of choices made with regard to the different elements of the intervention: the channel, the method, and its parameters (Bartholomew et al., 2006). The strategy (the actual concrete design of the intervention) had to be developed concerning these elements, the given target group of former cancer patients and social comparison as the main method.

The intervention. The intervention consisted of an interview with a duration of 20 minutes, providing social comparison information from or about former cancer patients that was sent to the target group in an auditory format (voice recordings only) on CD-ROM or as an internet-stream. The social comparison scripts were entirely pre-designed. Professional actors played either a former cancer patient speaking about his or her own experiences, or a female psychological oncological expert was speaking about her patients' experiences. The participants were kindly asked to listen at least once to the entire interview.

The channel. For the current thesis, an *auditory* channel (an audio recording) was chosen. An auditory format differs from written or audio-visual formats in different aspects. Auditory presented social comparison information is more vivid than written social comparison information. When information is vivid, it more strongly attracts and holds a person's attention, and can therefore have stronger effects (Chaiken & Eagly, 1983). In addition, compared to a written message, an audio recording is a more direct and immediate form of communication which produces a heightened sense of presence of the messenger, resulting in a higher level of trust and cooperation (Jensen, Farnham, Drucker, & Kollock, 2000). Listening to another person's voice enhances the perception of social proximity. Furthermore, nonverbal characteristics of the messenger are present in auditory messages but absent in written messages. For instance, the messenger's personal characteristics, such as gender, age, intonation and emotional cues, may be more salient (Chaiken & Eagly, 1983).

Compared to information from audio-visual media, such as video clips, the information gained from audio recordings leaves more room for interpretation because visual characteristics are absent. The presentation of visual characteristics may limit the receiver's imagination. It may even distract the recipient from important content information, or may complicate the social comparison processes because some visual characteristics of the messenger may not match the recipient's motives for social comparison.

In conclusion, audio recordings may be especially appropriate to communicate social comparison information because they make the social comparison target more salient relatively to the content information (i.e., what the target is telling), while there are no salient visual characteristics that may distract or complicate social comparison. In auditory communication the social comparison target is close, but there is room for imagination for the recipients. Thus, auditory communication can more precisely hit the required abstraction level for the target to identify with the messenger and accept the information.

The method. The next element that needs to be specified in the framework of HELP, is the method. The method refers to the technique that is used to induce change. For the current method, social comparison was chosen. Social comparison can improve cancer patients' quality of life, affective responses, and self-evaluations (Bennenbroek et al., 2003; Buunk, Collins, Taylor, VanYperen, & Dakof, 1990; Buunk et al., 2009; Stanton, et al., 1999). Several aspects of the social comparison information influence its effects. In the current research, cancer patients received different types of social comparison information that were presented by different sources.

Voluntary versus involuntary social comparison information. One basic idea in social comparison research is that people make social comparisons spontaneously because they have a need to compare (Van der Zee et al.,1996). It is reasonable to argue that former cancer patients will look for comparisons when they expect this to fulfill their needs (Bennenbroek et al., 2002). Patients may, however, not always have the opportunity to choose their social comparison targets voluntarily, but will often be confronted involuntarily with social comparison information. Medical patients, for example, are likely to encounter other patients in the waiting room, in their social circles, or in support groups. It is plausible that many patients are inevitably confronted with fellow patients who provide them with information they would never have sought out themselves spontaneously. In addition, stories about cancer and cancer patients are profusely covered in the media. Interviews with cancer patients frequently appear in magazine articles, newspapers, and on the radio or television. In addition, friends and relatives often tell cancer patients about other patients in an effort to be helpful (Taylor, et al., 1993). These stories about fellow patients may be about more or less unfortunate others. Thus, while cancer survivors may have different needs for social comparison information, in the current research they were confronted with social comparison information they did not choose themselves. They were kindly asked to listen to the information they were provided with.

Types of social comparison information. Bennenbroek and colleagues (2003) distinguished two types of social comparison information for cancer patients. The first concerns the negative emotions others experience due to cancer, such as feeling insecure, afraid, desperate, stressed, restless, nervous, sad, lonely, irritated, ashamed, patronized, and angry. The second type concerns coping strategies others use in similar situations (Bennenbroek et al., 2002), such as, actively handling the situation, palliative reacting, seeking social support, expressing emotions, and elaborating on reassuring thoughts. Both types of information are meaningful for former cancer patients and have the potential to increase their quality of life (Bennenbroek et al., 2003). In the study of Bennenbroek et al. (2003) cancer patients who underwent radiation therapy received an audio tape of approximately 20 minutes to listen to. The content was either about emotions, coping or about the therapeutic procedure. In the condition that was intended to include solely coping strategies, however, also emotions were included in the social comparison information, such as, anger, bewilderment, joy, happiness, and peacefulness. Indeed, in everyday life, emotions and coping information are often provided together (Silver, Wortman, & Crofton, 1990). That is, in testimonials of (former) cancer patients, one may often come across ex-

perienced negative emotions, as well as a means to cope with the situation. For the recipient, the information about negative emotions may be emotionally intense and may have strong effects. This intense information may be provided in the relatively positive context of coping, which can give a sense of control over the situation. In the present research, care is taken to design social comparison information on emotions-only, on coping-only, and on the integrated combination of both types of information. In the current thesis the differential effects of these types of social comparison information on quality of life will be explored.

Sources of social comparison information. The source of social comparison information refers to who is communicating the information to the recipient. The source of the social comparison information can, for instance, be a fellow patient or a friend who talks about him or herself. The information, however, can be easily perceived as non-reliable because it is based on one person's experience, and therefore as not relevant. In their daily life, cancer patients may also come across information on fellow patients from the oncological experts they can encounter. These experts may talk about their other patients, providing more general and more averaged information (Hagger & Orbell, 2005). The expert (not being the social comparison target him or herself) may represent the professional consensus about how former cancer patients act, in general. This information could have more effect than the same kind of information from only one fellow patient (Wells & Harvey, 1977) and might be considered as more reliable (Krosnick & Sedikides, 1990). Indeed, thinking of other cancer patients in general is common, and preferred by cancer patients who have finished their treatment (Van der Zee, Buunk, Sanderman, Botke, & van den Bergh, 2000). Therefore, compared to information from individual patients, the expert's information may be received as more interesting and valid. Therefore, general social comparison information might lead to larger changes in subjective quality of life than individual/idiosyncratic social comparison information.

Source and target similarity. In the HELP framework of intervention development, the method used in the present research is social comparison, and one important parameter for this method to make it effective is a basic similarity between the comparison target and the recipient of the information (Buunk & Van Vught, 2008). Similarity refers to how much individuals can recognize themselves in the comparison target. It is the degree to which the comparison other appears identical to the recipient on relevant dimensions. The tendency to compare oneself with an individual decreases when this other person is less similar to oneself (Festinger, 1954): When others are too divergent from the self, no accurate self-assessment can be made (Corcoran, Crusius, & Mussweiler, 2011). Research has shown that information from dissimilar others can be dismissed as irrelevant (Wheeler, 1991; Wood, 1989; Salovey, 1991; Major, Testa, & Blysma, 1991). Therefore, in designing effective social comparison information it seems important that the social comparison target is similar to the recipient. In the present framework, similarity with regard to the stressor, which is in this case the type of cancer (Taylor et al., 1990) is relevant, as are age and gender (Buunk & Gibbons, 2006). In the present research, the social comparison information was always from or about one or more similar (type of cancer, age, gender) former cancer patients. This was accomplished by computer-tailoring.

Besides this personalization of the social comparison-target(s) in the present intervention, the social comparison information was also adapted to the individual recipient on the topics that the recipient was especially interested in. Some cancer survivors may be especially interested in how to cope with the fear for the return of the cancer and less interested in reorganizing their social lives. It is expected that this personalized and adapted social comparison information will be perceived as more self-relevant because its content has a strong similarity to the self and can better fulfill one's needs for information, and therefore becomes probably more fluently processed (Dijkstra, 2008) with consequently a greater effect.

The strategy. The format of communicating the social comparison information was an interview of approximately 20 minutes. An interviewer asked questions and one or two fellow patients or a psychological oncology expert answered the questions. The strategy for the type of social comparison information was defined first. After a literature study, interviewing oncology health care practitioners, and former cancer patients themselves, the concrete contents of the negative emotions condition and the coping condition were composed. The negative emotions condition presented emotions such as: uncertainty, worry, fear, despair, tenseness, restlessness, nervousness, sadness, loneliness, irritation, shame, feeling patronized, anger and relief. The coping condition presented coping strategies, such as, actively handling the situation, palliative reacting, seeking social support, expressing emotions, and elaborating on reassuring thoughts. In the combination condition, the same negative emotions as well as coping strategies were combined and integrated. In order to standardize the duration of the interview, in the emotion-only and coping-only condition filler sentences were used with redundant information (for example: "That is simply the way it is " or "Things always arrive differently than expected") or similar information was provided using more words.

The same topics were addressed in the emotions, coping, and combination conditions. The topics were: coming home after treatment, fatigue and not being able to do things like before, ruminating thoughts, fear for the return of the cancer, physical dysfunction, problems with concentration, a set-back after treatment for cancer, future perspectives, and value change after having had cancer. Besides the same topics, the different conditions were matched on the order of the topics, the manner of how things were said, and the total length of the interview.

The method's parameter of similarity of the social comparison target was conducted by using computer technology. At the start of all studies, patients filled out questions about gender, age, and type of cancer. This input was used to provide individual cancer survivors with social comparison information from targets that were similar on these dimensions (Dijkstra, 2008). For example, a woman of 56 who survived breast cancer received social comparison information from a target individual of the same gender, with the same type of cancer, and of similar age.

The social comparison interventions. In sum, the target group consisted of cancer survivors who had finished treatment during the past 12 months, and the social comparison interventions in this research were designed to increase subjective quality of life (end variable), by influencing the social comparisons of former cancer patients (variable to be changed). This was accomplished by providing auditory social comparison information (method) with differ-

ent types of social comparison information (emotions, coping, combination), that was presented by one or two comparison others (fellow patient) or comprised generalized information about fellow patients (from a psychological oncology expert), with personalized and adapted information (method parameter). The format of communicating the social comparison information was an interview with social comparison information about cancer patients' experiences with recovering from cancer (strategy). More detailed information on the interventions is provided in the empirical chapters.

Overview of the empirical chapters

In three empirical chapters, three different interventions are presented; each tested in an independently recruited sample of cancer survivors.

Chapter 2. This chapter reports on the first empirical study. In this study it was tested to what extent the effects of the social comparison information depended on the recipients' perceived physical health and the recipients' sensitivity to social comparison information. First, I conducted a pilot study to evaluate the manipulations. Participants were 101 psychology students. Next, the main study among 139 cancer survivors was carried out. This first social comparison intervention was tested in a randomized field experiment with a post-test after three weeks and one after two months, with subjective quality of life and life satisfaction as dependent variables. The personalized sources of the auditory social comparison information were two cancer survivors who were interviewed and provided their testimonial in three different social comparison conditions, while there was one control condition. The three social comparison conditions provided information on emotions-only, on coping-only, or on the combination of both emotions and coping. The control condition was comprised of melodic guitar music.

Chapter 3. In this chapter the second empirical study is presented. In this study it was again tested to what extent the effects of the social comparison information depended on the recipients' perceived physical health and the recipients' sensitivity to social comparison information, but now with an expert who provided generalized social comparison information.

In this study 154 cancer survivors were exposed to the social comparison intervention in a randomized field experiment with a post-test after three weeks and one after two months, with subjective quality of life and life satisfaction as dependent variables. The source of the auditory social comparison information was an expert in the oncological field. This expert was interviewed and provided generalized social comparison information about cancer survivors' experiences in three different conditions, while there was one control condition. The expert conditions provided information on emotions-only, on coping-only, or on the combination of both. In the control condition the cancer patients received the patient source condition that was most effective for them; the social comparison information was adjusted to their individual characteristics based on the results of the first study (thus either a patient emotions, patient coping or a patient combination condition).

Chapter 4. In this chapter the third empirical study is reported. In this study it was tested to what extent the effects of the social comparison information depended on the recipients' health expectations or the recipients' perceived life threat. [1] This final study was a field experiment among 150 cancer survivors with the intervention based on the results of the first and second study, with only a post-test after two months and quality of life and life satisfaction as dependent variables. In the experimental condition cancer patients received the social comparison information auditory recording that was most effective for them; the social comparison information was adjusted to their individual characteristics based on the results of the previous two studies. In the control condition cancer patients received no social comparison information.

To conclude. The aim of this thesis was to test whether a brief exposure to auditory social comparison information had an effect on the cancer survivors' quality of life two months later. The search was for individual differences responsible for differential effects.

Footnote

[1]Note that all chapters have been written to be read independently. Therefore, possible overlap between chapters could not be avoided. The empirical chapters (chapters 2-4) are based on collaborative research; consequently those chapters refer to 'we' instead of 'I'.

Chapter 2

Impact of Social Comparison on Cancer Survivors' Quality of Life: An Experimental Field Study

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Impact of Social Comparison on Cancer Survivors' Quality of Life: An Experimental Field Study[1]

Abstract

For cancer survivors, the recovery phase after hospital treatment can be bothersome. Social
comparison information from fellow cancer survivors can improve the quality of life in this situation. In a randomized field experiment, 139 Dutch cancer survivors (M_{age} = 52 years; 70.5% women) were assigned to a control condition or 1 of 3 experimental conditions in which they listened to an interview with fellow cancer survivors. The interview's content is about patients' negative emotions and/or the effective coping strategies patients used. A validation study among 101 students showed that the conditions were perceived as intended. In the main study, quality of life was assessed after 2 months (using the LASA, Cantrils' Ladder, and 2 items of the EORTC-C30). The effects of the interviews depended on the participants' self-reported health status and sensitivity to social comparison information ($p < .001$). Highly sensitive patients with a good health status benefited from the information; in those not sensitive, quality of life diminished. In patients with a poor health status, the effects were reverse. This study showed that a brief intervention comprised of testimonials of fellow cancer survivors had an impact on the quality of life of cancer survivors after 2 months. However, subgroups of patients were detected whose quality of life decreased because of the intervention. These results stress the need to be careful in providing social comparison information and to consider side effects of psychosocial interventions.

1 This chapter is based on: Brakel, T. M., Dijkstra, A., Buunk, A. P., & Siero, F. W. (2012[a]). Impact of social comparison on cancer survivors' quality of life: An experimental field study. *Health Psychology*, doi:10.1037/a0026572

Impact of Social Comparison on Cancer Survivors' Quality of Life: An Experimental Field Study

In the recovery phase the first year after successful treatment for cancer in the hospital, quality of life of cancer survivors is still under pressure (Ganz et al., 2002; Morgan, 2009). Quality of life reflects the subjective evaluation of how a person is doing, feeling, and functioning overall in life, and the relevance of this to the person (Leventhal & Colman, 1997). In this subjective evaluation, cancer survivors take into account how they compare to other people in similar circumstances (Schwartz & Sprangers, 1999). These social comparisons provide potentially important information about other patients' actions, opinions, and experiences (Buunk et al., 2009; Festinger, 1954). Listening to testimonials of fellow patients may help people develop their own perspective, can have reassuring effects, can lead to positive affect (Stanton, Danoff-Burg, Cameron, Snider, & Kirk, 1999), and can lead to an increase in quality of life (Bennenbroek et al., 2003).

Instances of testimonials from fellow cancer survivors can be found in leaflets distributed in the health care system, in self-help books, in magazines, and on websites. However, not all social comparison information in these testimonials may be beneficial to all cancer survivors (Bennenbroek et al., 2003). Empirical data show that social comparison information has to be provided with care and individual differences should be taken into account. The purpose of the present study was to examine which individual differences may moderate the effects of social comparison information on the quality of life of cancer survivors.

Social Comparison Direction and Self-Reported Health Status

Whether social comparison information is beneficial or detrimental for a person coping with cancer depends, first, on how the person perceives the social comparison other. Is this other perceived as doing and coping better (upward comparison) or doing and coping worse (downward comparison) compared with the patient? Second, it depends on whether the person feels similar to the comparison other and perceives the other person's state as a possible future (identification), or feels different from the comparison other (contrast; Buunk & Ybema, 1997; Dibb & Yardley, 2006; Van der Zee, Buunk, Sanderman, Botke, & Van der Bergh, 2000). Together, these dimensions determine four social comparison processes with different outcomes.

Upward identification may lead to positive feelings; the cancer survivor feels that he or she can improve and may become more like the comparison other in a positive sense (Stanton et al., 1999; Taylor & Lobel, 1989). Upward contrast may lead to negative consequences; the patient feels different and inferior relative to the comparison other (Carmona, Buunk, Peiró, Rodríguez, & Bravo, 2006). Downward contrast may lead to positive feelings; the cancer survivor feels different from the comparison other in a positive way, he or she is doing or coping better (Stanton et al., 1999; Van der Zee et al., 1996; Wills, 1981). Downward identification may lead to negative consequences; the cancer survivor feels similar and focuses on the possibility of deteriorating as well (Buunk & Ybema, 1997; Carmona et al., 2006).

People may to some extent regulate whether they compare themselves "upward" or "downward" to others (Taylor & Lobel, 1989; Taylor, Wood, & Lichtman, 1983). Patients may, for instance, search for dimensions on which the comparison other is worse off in order to enhance themselves, and ignore parts of the information that are unfavorable. How someone experiences their own position, however, puts constraints on the extent to which people can shift the position of the comparison other in an upward or downward direction. When one is relatively "up", it is not easy to shift the position of the social comparison other in an even more upward direction for comparison. In a similar manner, when one is relatively "down", it is not easy to shift the position of the social comparison other in a downward direction. This constraint effect on social comparison in general may also determine the outcomes of social comparisons in cancer survivors (Van der Zee et al., 1996). We expected that patients, who subjectively experience their functioning as being well – who report to have a good health status – would perceive the provided social comparison information as downward comparison information, and that cancer survivors who report a poor health status would perceive the same social comparison information as upward information (Hypothesis 1).

Individual Differences in Social Comparison

In addition to people's perceptions of their own health status, individual differences in the processing of social comparison information may also determine the social comparison outcome. One individual difference that may be related to the effects of social comparison information is Social Comparison Sensitivity (SCS). In the literature, people are identified who respond with a greater or lesser degree of sensitivity to other people's good fortune or failures (Gibbons, 1986; Lyubomirsky & Ross, 1997; Lyubomirsky, Tucker, & Kasri, 2001; McFarland & Miller, 1994; Swallow & Kuiper, 1988). Evidence suggests that an increased sensitivity to social comparison information is present in uncertain people for whom this kind of information has a great impact on their self-evaluations (Weary, Elbin & Hill, 1987). People sensitive to social comparisons have a heightened self-awareness, which results in a greater reliance on social standards for self-evaluations (Diener & Srull, 1979), an intensified affective responsiveness (Hoberman & Lewinsohn, 1985), and an extreme mood variability that is accompanied by reactivity (Bogart, Benotsch, & Pavlovic, 2004). They seem sensitive and open to social comparison information in normal daily life; they compare themselves in detail, intensively, and vividly with the social comparison target. Given these findings, we defined SCS as the chronic tendency to experience positive or negative emotions in response to social comparison information. When the subject of comparison is relevant and threatening – as with cancer – these highly sensitive and emotional patients activate self-regulation processes may to cope with the information. They engage in psychological contrasting: They focus on the differences between themselves and the comparison other in order to avoid the disturbing emotional impact of the information. Patients high in SCS contrast whenever possible when they are confronted with information about other patients'

experiences with cancer, in order to down-regulate the strong emotions it activates. They try to escape from being similar to the standard of the typical cancer patient and look for differences between themselves and the other.

In contrast, people low on SCS show an opposite reaction; they show less strong reactions to information about others (see Ahrens & Alloy, 1997). Because they are less moved by social comparison information, they do not have the need to contrast themselves away from the comparison other, they do not become reactive. Instead, they engage in similarity testing, which is the default social comparison process, according to Mussweiler (2003). They look for similarities between themselves and the comparison other, assimilate social comparison information more easily and integrate it into their self-representation (Förster, Liberman, & Kuschel, 2008). Especially when the social comparison other activates information that is relevant for one's self-view, automatic assimilative processes may occur. Thus, in people low in SCS, social comparison information brings about less emotional turmoil and reactivity, but because they do process the information it has its psychological effects: They approach or assimilate the information of the social comparison other.

Based on these details we formulated two hypotheses about patients' quality of life when confronted with social comparison information on the topic of cancer. Hypothesis 2 (see Table 1): When patients have a good health status, others are seen as worse off (the constraint-effect). In cases of high SCS, they contrast themselves with these worse off others, which was expected to increase quality of life (Hypothesis 2a). In cases of low SCS, they assimilate the information of these worse-off others, which was expected to lower quality of life (Hypothesis 2b). Hypothesis 3 (see Table 1): When patients have a poor self-reported health status, others are seen as better off (the constraint effect). In cases of high SCS, they contrast themselves with these others who are better off, which was expected to lower quality of life (Hypothesis 3a). In cases of a low SCS, they were expected to assimilate the information of the better-off other, which was expected to increase quality of life (Hypothesis 3b).

Table 1. Hypotheses 2 and 3 on the Interaction of Health Status and Social Comparison Sensitivity and Their Effects on Quality of Life.

Hypothesis	Health status	SCS	Assumed process	Social comparison effect
2a	Good; others look worse off	High	Downward contrast	Quality of life ↑
2b		Low	Downward adaptation	Quality of life ↓
3a	Poor; others look better off	High	Upward contrast	Quality of life ↓
3b		Low	Upward adaptation	Quality of life ↑

Note: SCS = Social Comparison Sensitivity

Type of Social Comparison Information

In the above reasoning, we do not distinguish between different types of social comparison information, although in the present framework with cancer patients, at least two relevant types of information can be distinguished. Social comparison information in this study may concern negative emotions another cancer survivor experienced due to cancer and coping strategies that this other cancer survivor used in this situation (Bennenbroek, Buunk, Van der Zee, & Grol, 2002). Both types of information are meaningful for cancer survivors and in certain circumstances have the potential to increase cancer survivors' quality of life (Bennenbroek et al., 2003). In everyday life, both types of information are provided together. That is, in testimonials of (former) cancer patients it is natural to tell about the negative emotions as well as what they did to feel better (coping). In such a testimonial, information on negative emotions with a potentially large impact is provided in a relatively positive context of coping and control. However, because information on negative emotions and information on coping differ essentially – for example, in emotional intensity and instructiveness – they may be perceived very differently when presented in isolation. For example, it is possible that negative emotions that are not framed in the context of coping are perceived as more threatening (Silver, Wortman, & Crofton, 1990), while a testimonial on coping-only is perceived as unnatural and deceptive as it is normal to mourn after a negative life event (Silver et al., 1990). It may be that the effects expected in Hypothesis 2 and 3 occur especially with a specific type of social comparison information. To explore this issue, we included cancer survivors with the naturalistic combination of both types of information, and two conditions in which social comparison information with emotions or coping were provided separately. The exploratory fourth hypothesis was that the above effects on quality of life and life satisfaction may differ for the type of social comparison information (emotion vs. coping and separate vs. combined; Hypothesis 4).

The Present Study

In the present study, we provided cancer survivors with different types of social comparison information through audio recordings of interviews with fellow cancer survivors. Besides quality of life, the similar construct of life satisfaction was assessed as an outcome measure at the follow-ups after 3 weeks and 2 months. The moderating effects of the participants' self-reported health status and SCS were tested. We controlled for two possible related individual differences involved in the processing of social comparison information. These were Social Comparison Orientation (SCO), because people high on SCO can also have emotional reactions to social comparisons (Gibbons & Buunk, 1999), and illness-related perceived control, because it has been shown to be related to quality of life (Ferrell, Dow, & Grant, 1995).

Method

Development of the Audio Files Audio files containing different types of social comparison information were developed and tested in a pilot study. To develop the audio files, recordings were made of patients' testimonials. The content was based partly on an earlier study on testimonials by Bennenbroek and colleagues (2003), on books written by cancer patients (e.g., van der Stap, 2006), and on the literature (e.g., Pool, Heuvel, Ranchor, & Sanderman, 2004), but largely on clinical experience with cancer patients and interviews with professionals in the field of psychosocial oncology. The testimonials were in an interview-like format: An interviewer asked short, open questions and two cancer patients answered the questions alternately. Professionals acted the interviews with the help of a professional director, and a sound technician recorded the interviews in a professional audio studio.

Differences and Similarities of the Content of the Interviews

Three interview scripts were developed, one for each experimental condition: emotions-only, coping-only, and emotions and coping combined. In the emotions condition, the interviewees talked only about negative emotions, such as feeling insecure, afraid, desperate, stressed, restless, nervous, sad, lonely, irritated, ashamed, patronized, and angry. In the coping condition, the interviewees only talked about the use of coping strategies, such as actively handling the situation, palliative reacting, seeking social support, expression of emotions, and reassuring thoughts. In the combination condition, the interviewees talked about negative emotions as well as about coping strategies. The same topics were addressed in all three conditions. The topics included fatigue, ruminating thoughts, fear for the return of the cancer, physical dysfunction, and setback after treatment for cancer. The scripts in the different conditions were the same with regard to the topics that were addressed, the order of the topics, the use of language, and the total length of the interview (approximately 20 min.).

Pilot Study

A pilot study we conducted was to verify the condition-specific qualities of the interviews. It was expected that patients in the emotions-only condition and the combination condition would be aware of the emotions present in the content of the audio file. It was also expected that patients in the coping and combination conditions would be aware of the coping strategies present in the content of the audio file. The participants were 101 female psychology students ($M_{age} = 20.90$ years, $SD = 2.69$). Based on randomization, participants received one of the three audio recordings (negative emotions, coping strategies, or negative emotions and coping strategies combined). They were unaware of the existence of different conditions.

The internal consistency of the judgments of 101 raters on the fragments was sufficiently high, ranging from $\alpha = .77$ to $\alpha = .98$. The interviews were seen as equally credible, convincing, and comprehensible; $ps > .10$. Next, we rated the amount of information on negative emotions and on coping strategies (answers ranged on a 5-point scale from *never* (1), *rarely* (2), *sometimes* (3), *regular* (4), to *often* (5)). Most emotions were identified in the emotions ($M = 4.88$, $SD = 0.33$) and the combination condition ($M = 4.35$, $SD = 0.60$), and the least in the coping condition ($M = 2.73$, $SD = 0.76$), $F(2, 98) = 121.87$, $p < .001$. Most coping strategies were identified in the coping condition ($M = 4.76$, $SD = 0.50$) and the combination condition ($M = 4.56$, $SD = 0.56$), and the least in the emotions condition ($M = 2.62$, $SD = 0.78$), $F(2, 98) = 120.28$, $p < .001$. We conclude that the manipulations of the content of the interviews were successful.

Participants Main Study

Cancer survivors who had suffered from different types of cancer and who had finished their hospital treatment in the previous year responded by email or telephone to advertisements in local newspapers and on various health and cancer-related websites. Participants needed to have sufficient knowledge of the Dutch language, in which the interviews were presented. They could differ in type of cancer, degree of bodily mutilation, required physical care, and prognosis, although participants with a reported incurable cancer were excluded from participation.

Design

The cancer survivors were assigned randomly to one of three experimental conditions or to one control condition. They were told that the aim of the study was to develop new patient information for people who had finished a cancer treatment. First, the respondents filled in an informed consent form. Next, they completed a pre-test questionnaire, either on paper or through the Internet. About one week later, they received (after randomization on inclusion) one of the four condition-specific audio CDs. We refer to the text above for a description of the content of the three different interviews in the experimental conditions. The CD in the control condition contained relaxing guitar music and a melodious voice without text. The respondents were not aware that there were CDs with a different content. Respondents were instructed to listen at least once to the CD they received. They were asked to fill in a short process measure after listening to the CD. Three weeks and 2 months after receiving the CD, the respondents filled in follow-up questionnaires. Ethical approval for this study was obtained from the ethics committee of the Medical Ethical Evaluation Committee of the University Medical Centre Groningen (METc, 2006/088).

Tailored Information

To increase the personal relevance of the testimonials, the interviews were partly tailored to individual characteristics (Dijkstra, 2008). To tailor the information, the interviewees' gender, type of cancer, and age (plus and minus 3 years, in order not to arouse suspicion) were matched. A female former breast cancer patient of 55 years, for instance, received an interview with two other female cancer survivors of 52 and 58 years of age; both testimonials were about breast cancer. From all the different pieces of audio recording (2 for gender, 67 for age, 32 for cancer type, and 3 for condition), the recordings that corresponded with the individual characteristics of the particular participant and the necessary condition were picked and merged using a computer program to form one coherent interview in an auditory format.

Pre-test Measures

Quality of life. The measure of quality of life was composed of three existing scales. The first scale was one subscale of the EORTC QLQ-C30 (version 3.0; Scott et al., 2009), assessing global health status and quality of life (items 29 and 30): "How would you rate your overall health/overall quality of life during the past week?" Answers ranged on 7-point scales from *very poor* (1) to *excellent* (7). The second scale was the Linear Analogue Self-Assessment scale (LASA overall and LASA physical; Locke et al., 2007). For LASA overall quality of life, ratings were made along a line, with on the left a label *lowest possible quality* and on the right *highest possible quality*. The LASA-physical, for an estimation of overall health, was expressed in a percentage (maximum 100%). The third scale was Cantrils' Ladder (Cantril, 1965). Respondents could rate their current quality of life on a ladder ranging from 0 to 10, where 0 reflects *worst imaginable quality of life* and 10 reflects *best imaginable quality of life*. To compute our composite quality of life score, the scores on the above items were converted to a scale of 1 to 7 and additionally averaged; $\alpha_{pre} = .90$; $\alpha_{post} = .93$).

Life satisfaction. Life satisfaction was measured using the Life Satisfaction Scale (Brakel & Dijkstra, 2008). This is a brief research instrument of five items to measure satisfaction with one's life in general, with one's psychological state, with one's social contacts, and with one's functioning during daily activities; for instance, "During the past week, how satisfied were you in general?" Answers ranged on 7-point scales from *not at all* (1) to *very much* (7) ($\alpha_{pre} = .87$; $\alpha_{post} = .88$).

Social comparison orientation. Social comparison orientation was measured using the IOWA Netherlands Comparison Orientation Measurement (INCOM, Gibbons & Buunk, 1999). This scale consists of 11 items with statements. Agreement needed to be indicated on 5-point scales ranging from *strongly disagree* (1) to *strongly agree* (5); for instance, "I always like to know what others in a similar situation would do" ($\alpha_{pre} = .83$).

Social comparison sensitivity. Social comparison sensitivity was measured using the Identification-Contrast-Scale (IC-scale), originally developed and tested with cancer patients (Van der Zee et al., 2000; Dibb & Yardley, 2006). It is used to measure dispositional tendencies for upward and downward identification and contrast, with four subscales. When all 12 items are considered together, the correspondence with the statements indicate how much emotional impact comparisons have in general. It consists of 5-point scales ranging from *strongly disagree* (1) to *strongly agree* (5), like "If I think about others who are better off, I feel frustrated about my own situation" ($\alpha_{pre} = .83$).

Self-reported health status. To assess the self-reported health status of the participants, we asked them to answer 28 items about their health. These items are based on the EORTC QOL-C30, which is referred to as a quality-of-life measure but instead measures subjective health status according to Leplège and Hunt, 1997). The items were divided over five functional scales (physical, role, cognitive, emotional, and social), three symptom scales (fatigue, pain, and nausea and vomiting), and several single-item symptom measures. All questions started with the phrase "During the past week…" followed by the second part, for instance, "Were you in pain?," "Were you short of breath?," or "Were you tired?" Answers ranged on a 7-point scale from *not at all* (1) to *very much* (7), $\alpha = .93$.

Illness related control. Illness-related perceived control was measured with a scale of 6 items based on the Dutch Adaptation of the General Self-Efficacy scale (Teeuw, Schwarzer & Jerusalem, 1994), for instance: "If I put enough effort in it I expect that I can solve the problems I have as a consequence of my illness." Answers could be given on a scale ranching from *strongly disagree* (1) to *strongly agree* (5), ($\alpha = .46$).

Process Measures

Condition evaluation. To gain insight into the evaluations of the conditions on primary process variables, we asked participants in the three experimental conditions to rate their CD on comprehensibility, clarity, novelty, reliability, credibility, length, and recall; for instance, "To what extent did you think the information was reliable?" Answers were given on a 7-point scale ranging from *not at all* (1) to *very much* (7).

Perceived direction of social comparison. To test the direction of participants' social comparison, two questions (with 7-point answering scales) were asked. These questions were "To what extent is the situation of the persons in the interview better or worse than the situation you are in yourself at this moment?" and "To what extent do the persons from the interview deal better or worse with the situation than you do?"

Drop Out and Attrition Analyses

After various calls were made in the media, 178 cancer survivors responded (during 11 months in 2008) and returned the pre-measurement: 73% signed in through the Internet and 27% by telephone. Of the 178 cancer survivors, 17 did not return the short process questionnaire that we posted together with the audio CD. Another 22 cancer survivors did not return the post-measurement 2 months later. Thus, of the 178 cancer survivors that filled in the pre-test, 139 (78%) filled in all measurements. The number of dropouts did not differ per condition, $p = .29$. Reasons we identified for dropout were that patients did not meet the criteria, death of the patient or a relative, questionnaire too long, questions too personal or not seeming useful, and poor physical health. The distribution of the participants over the conditions was as follows: emotions 42, coping 37, combination 30, and control condition 30.

The sample consisted mostly of women (70.5%). The age of the cancer survivors varied from 21 to 85 years ($M_{age} = 51.94$, $SD = 12.51$). Most had a higher level of education (46.1%), were married or had a partner (74.1%), and were not religious (60.4%). All patients were Caucasians. The cancer survivors were treated for a wide variety of types of cancer. The most prevalent form of cancer was breast cancer ($n = 61$). See also Table 2 for demographic characteristics.

Table 2. Demographic Composition of Sample of the Main Study

	Full sample		Emotion		Coping		Combination		Music	
	N	%	N	%	N	%	N	%	N	%
Sex										
Male	41	29.5	11	26.2	11	29.7	10	33.3	9	30
Female	98	70.5	31	73.8	26	70.3	20	66.7	21	70
Age Range										
18-30	8	5.8	1	2.4	5	13.5	1	3.4	1	3.3
31-40	15	10.7	7	16.6	1	2.7	6	20.0	1	3.3
41-50	40	28.8	12	28.6	12	32.5	6	20.0	10	33.4
51-60	40	28.8	13	31.0	9	24.3	9	30.0	9	30.0
61-70	27	19.4	8	19.0	7	18.9	4	13.3	8	26.7
>71	9	6.5	1	2.4	3	8.1	4	13.3	1	3.3
Total	139	100	42	100	37	100	30	100	30	100
Marital Status										
Married	87	62.6	27	64.3	22	59.5	17	56.7	21	70.0
Living together	16	11.5	5	11.9	5	13.5	5	16.7	1	3.3
Partner, not living together	10	7.2	2	4.8	2	5.4	4	13.3	2	6.7
Single	17	12.2	7	16.7	6	16.2	1	3.3	3	10.0
Sep/Div/Wid	9	6.5	1	2.4	2	5.4	3	10.0	3	10.0
Education										
Low	18	12.9	4	9.5	3	8.1	6	20.0	5	16.7
Middle	53	38.1	22	52.4	13	35.1	10	33.3	8	26.7
High	64	46.1	16	38.1	19	51.4	13	43.4	16	53.3
Not known	4	2.9	0	0.0	2	5.4	1	3.3	1	3.3
Most prevalent cancer types										
Breast Cancer	61	43.9	26	61.9	15	40.5	8	26.7	12	40.0
Non-Hodgkin	14	10.1	3	7.1	4	10.8	3	10.0	4	13.3
Colon Cancer	17	12.2	3	7.1	7	18.9	4	13.3	3	10.0
Hodgkin	8	5.8	3	7.1	3	8.1	2	6.7	0	0.0
Lung Cancer	10	7.2	1	2.4	3	8.1	2	6.7	4	13.3
Time since treatment										
Months	9		11		8		9		9	
Religion										
Not religious	84	60.4	27	64.3	18	48.6	21	70.0	18	60.0
Christian	54	38.8	15	35.7	19	51.4	9	30.0	11	36.7
Buddhist	1	0.7	0	0.0	0	0.0	0	0.0	1	3.3

Note. Sep/div/wid = separated, divorced and/or widowed

Results

Randomization Check and Attrition Analyses

The study conditions did not differ significantly on demographic and medical variables administered on baseline prior to the manipulations or on pre-test quality of life. Thus, the randomization seemed to have been successful. Furthermore, non-responders were significantly more often female, $F(1, 177) = 4.39$, $p = .038$, without children, $F(1, 147) = 7.71$, $p = .006$, and cured according their doctor, $F(1, 172) = 5.21$, $p = .024$. They were also less satisfied with the hospital supervision, $F(1, 172) = 5.21$, $p = .024$, they joined a peer group more often, $F(1, 177) = 4.37$, $p = .038$, and their last treatment was longer ago, $F(1, 167) = 5.32$, $p = .022$.

Process Measurement

The conditions were compared on several process variables, assessed with the short process questionnaire, using ANOVAs. With regard to how well participants reported having listened to the audio file, the conditions did not differ significantly ($p = .62$). The majority of the patients listened to the entire audio file at least once (81%). Only one patient did not listen to the audio file and was removed from the dataset. A series of ANOVAs showed no effect of the experimental conditions on comprehensibility, clarity, novelty, reliability, credibility, self-reported recall, difficulty listening to the CD, appreciation of the length of the CD, and interest in the interview (all ps $> .30$).

Direction of Social Comparison

Two questions were posed to Test Hypothesis 1: cancer survivors with a good self-reported health status would make mostly downward comparisons while patients with a poor self-reported health status would make mostly upward comparisons. First, the position of the comparison other was observed differently by patients with a good or a poor self-reported health status, $F(1, 118) = 16.77$, $p < .001$, $\eta_p^2 = 0.12$. Those with a poor self-reported health status made a lateral comparison (score around the midpoint); they believed the situation of the others was neither better nor worse ($M = 3.94$, $SD = 1.66$). Cancer survivors with a good self-reported health status made, as expected, a downward comparison; they evaluated their own situation as better than that of the comparison others ($M = 5.04$, $SD = 1.29$). Second, coping with the illness of the comparison other was observed differently by cancer survivors with a good or a poor self-reported health status, $F(1, 118) = 8.15$, $p = .005$, $\eta_p^2 = 0.07$. Cancer survivors with a poor self-reported health status indicated that they thought they dealt with the situation neither better nor worse

than the cancer survivors from the interview did ($M = 3.89$, $SD = 0.95$). Cancer survivors with a good self-reported status thought they dealt a bit better with the situation than the patients from the interview ($M = 4.43$, $SD = 1.08$). Thus, patients with a good or poor self-reported health status did indeed observe their situation differently. The first hypothesis was partly confirmed; patients with a good self-reported health status made downward comparisons.

Main Analyses

Quality of life. To examine the moderating effects of the participants' self-reported health status and SCS on quality of life for the four different conditions, a Condition × SCS × Health Status ANCOVA was performed with the second post-test quality of life (2 months follow-up) as the dependent variable and pre-test quality of life as covariate (the 3 weeks follow-up measurement is not reported for reasons of practical relevance; the pattern of the results after 3 weeks was very similar to the pattern after 2 months). The results showed no significant main effects of condition ($p > .35$), nor of SCS ($p > .13$). There was a significant main effect of self-reported health status, $F(1, 98) = 4.47$, $p = .037$, $\eta_p^2 = 0.04$. The two-way interactions of Condition × SCS and Condition × Health Status were both nonsignificant ($ps > .16$). The two-way interaction SCS × Health Status was, however, significant ($F(1, 98) = 9.32$, $p = .003$, $\eta_p^2 = 0.09$), so was the three-way interaction Condition × SCS × Health Status, $F(3, 98) = 8.89$, $p < .001$, $\eta_p^2 = 0.21$.

Life satisfaction. The same procedure was repeated with life satisfaction as dependent variable and a similar pattern was found. There were no main effects of condition ($p > .52$) and SCS ($p = .08$). There was a significant main effect of self-reported health status, $F(1, 110) = 10.30$, $p = .002$, $\eta_p^2 = 0.09$. The two-way interactions of Condition × SCS and Condition × Health Status were again both nonsignificant ($ps > .16$). The two-way interaction SCS × Health Status was significant ($F(1, 110) = 9.79$, $p = .002$, $\eta_p^2 = 0.08$), so was the three-way interaction Condition × SCS × Health Status, $F(3, 110) = 9.97$, $p < .001$, $\eta_p^2 = 0.21$.

To examine the meaning of both three-way interactions (the one with quality of life and the other with life satisfaction), the data were analyzed by self-reported health status. Four groups were modeled in succession according to the procedure outlined by Cohen, Cohen, West, and Aiken (2003), in which – in contrast to the median split – the complete dataset is used. A group with poor self-reported health status was modeled by subtracting 1 standard deviation from the mean scores on self-reported health status and a group with good self-reported health status was modeled by adding 1 standard deviation to the mean scores on self-reported health status. To model patients with a high and low SCS, the same procedure was used. Figure 1a shows the mean scores in the four conditions on quality of life for patients with a good health status and high and low SCS; Figure 1b shows the mean scores for patients with a poor health status and high and low SCS.

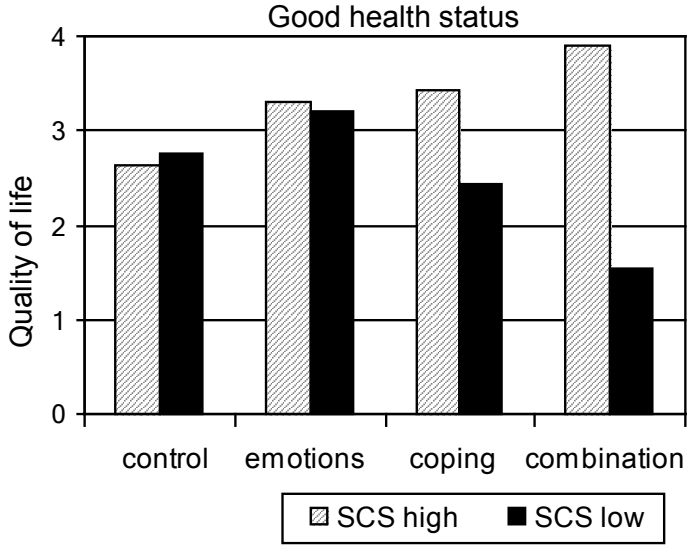

Figure 1a. Quality of life for patients with a *good* health status and high or low social comparison sensitivity across conditions. SCS = social comparison sensitivity.

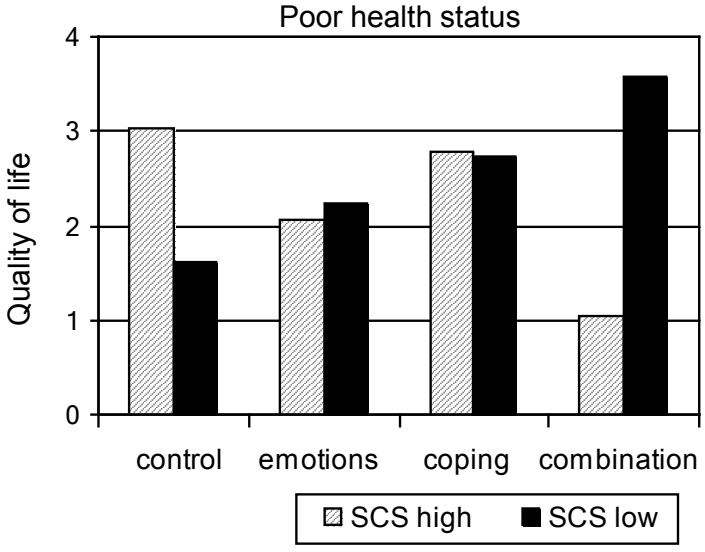

Figure 1b. Quality of life for patients with a *poor* health status and high or low social comparison sensitivity across conditions. SCS = social comparison sensitivity.

Good health status and quality of life. Among cancer survivors with a good health status, the Condition × SCS interaction was significant, $F(3, 98) = 4.40$, $p = .006$, $\eta_p^2 = 0.12$. To understand the meaning of the pattern of this interaction effect first, the contrasts between the experimental conditions and the control condition were examined. Next, the differences among the experimental conditions were tested.

High social comparison sensitivity. The expectation was that among patients with a relatively good health status (making mostly downward comparisons), the quality of life of those high in SCS would increase due to exposure to the different types of social comparison information (because they contrast and are "up" themselves; Hypothesis 2a). Contrasts showed that among patients with a high SCS, only the combination condition ($M = 3.91$) led to an increase in quality of life, $F(1, 98) = 4.45$, $p = .037$, $\eta_p^2 = 0.043$, compared to the control condition ($M = 2.64$). In addition, for participants high in SCS, the three experimental conditions did not differ from each other concerning quality of life, $ps > .38$.

Low social comparison sensitivity. The quality of life of those low in SCS was expected to decrease (because they adapt the information of the other from their "upward" position; Hypothesis 2b). Among cancer survivors with a low SCS, only the combination condition ($M = 1.54$) led to a decrease in quality of life, $F(1, 98) = 7.52$, $p = .007$, $\eta_p^2 = 0.07$, compared to the control condition ($M = 2.75$). In addition, the combination condition led to a significantly lower quality of life compared to both other experimental conditions (compared to the emotions condition ($M = 3.21$), $F(1, 98) = 14.42$, $p < .001$, $\eta_p^2 = 0.13$; compared to the coping condition ($M = 2.44$), $F(1, 98) = 4.21$, $p = .043$, $\eta_p^2 = 0.04$). The coping condition led also to a significantly lower quality of life compared to the emotions condition, $F(1, 98) = 5.71$, $p = .019$, $\eta_p^2 = 0.06$.

Thus, quality of life increased in patients when a good health status was accompanied with a high SCS (this verifies Hypothesis 2a), and decreased in those low in SCS (this verifies Hypothesis 2b). However, this pattern held only true for the combination condition, which concerns Hypothesis 4.

Poor health status and quality of life. Among cancer survivors with a poor health status, the Condition × SCS interaction was significant, $F(3, 98) = 8.19$, $p < .001$, $\eta_p^2 = 0.20$. To understand the meaning of the pattern of the interaction effect again the different contrasts were examined.

High social comparison sensitivity. The expectation was that among patients with a relatively poor health status (making mostly upward comparisons), the quality of life of those high in SCS would decrease (because they contrast and are "down" themselves; Hypothesis 3a). For patients with high SCS, the combination condition ($M = 1.05$) and the emotions condition ($M = 2.06$) led to a significant decrease in quality of life compared to the control condition ($M = 3.04$), respectively, $F(1, 98) = 13.86$, $p < .001$, $\eta_p^2 = 0.12$, and $F(1, 98) = 5.37$, $p = .023$, $\eta_p^2 = 0.05$. In addition, the experimental conditions were compared mutually. The combination condition led to a lower quality of life compared to the coping condition ($M = 2.78$), $F(1,$

98) = 10.59, $p = .002$, $\eta_p^2 = 0.10$ and was marginally lower compared to the emotions condition, $F(1, 98) = 3.51$, $p = .064$, $\eta_p^2 = 0.04$. The quality of life in the emotions condition was marginally lower than in the coping condition, $F(1, 98) = 2.97$, $p = .088$, $\eta_p^2 = 0.03$.

Low social comparison sensitivity. The quality of life of those low in SCS was expected to improve (because they adapt the information of the other from their "downward" position; Hypothesis 3b). Among patients with a low SCS, the combination condition ($M = 3.58$) and the coping condition ($M = 2.74$) both led to a significant increase in quality of life compared to the control condition ($M = 1.61$), respectively, $F(1, 98) = 11.03$, $p = .001$, $\eta_p^2 = 0.10$ and $F(1, 98) = 4.67$, $p = .033$, $\eta_p^2 = 0.05$. Comparison of the experimental conditions showed that the combination condition led to a higher quality of life not only compared to the control condition, but also compared to the emotions condition ($M = 2.24$), $F(1, 98) = 5.98$, $p = .016$, $\eta_p^2 = 0.06$.

Thus, for patients with a poor health status for those high in SCS, both the combination and emotions conditions led to a lower quality of life (this verifies Hypothesis 3a). For those low in SCS both the combination and coping conditions led to a higher quality of life (this verifies Hypothesis 3b). Together, the above results also confirm Hypothesis 4, that the effects on quality of life may differ for the type of social comparison; the reaction to the combination condition was stronger.

Life satisfaction. Based on the above results we elaborated on the three-way interaction: Condition × SCS × Health Status with post-test life satisfaction as dependent variable and pre-test life satisfaction as covariate in the same way as we did for the quality of life outcome measure. There was a significant two-way interaction of condition and social comparison sensitivity on life satisfaction, for patients with a good health status as well as for patients with a poor health status, respectively, $F(3, 90) = 6.12$, $p = .001$, $\eta_p^2 = 0.17$ and $F(3, 90) = 6.58$, $p < .001$, $\eta_p^2 = 0.18$. The patterns of the mean scores and the contrasts were highly similar to those of the same analyses with quality of life as dependent variable, and are not presented here.

Check for Confounding Variables

To make sure that the three-way interaction with SCS was not confounded by Social Comparison Orientation (SCO; one of the two possible related individual differences involved in the processing of social comparison information), it was rerun in a model that also included the (saturated) Condition × SCO × Health Status interaction, as advocated by Yzerbyt, Muller, and Judd (2004; i.e., both saturated models were combined in a single model). The three-way interaction with SCS remained almost unchanged, $F(3, 87) = 7.15$, $p < .001$, $\eta_p^2 = 0.20$, while the three-way interaction with SCO was not significant, $p = .74$. The same procedure was followed for perceived control, the second possible related individual difference. Again the three-way interaction with SCS remained almost unchanged, $F(3, 88) = 8.51$, $p < .001$, $\eta_p^2 = 0$ .23, and the three-way interaction with perceived control was not significant, $p = .22$. Thus, the effects of SCS exist independently of the scores on the measures of SCO and illness related perceived control.

A Match-mismatch Test

The results show that for some cancer survivors, a specific type of information was effective, while another type of information was not effective: Some types of information "matched" these individuals, while other types of information "mismatched" them. To get an idea about how relevant matching is, we tested how large the difference in quality of life was between participants who were matched versus participants who were mismatched. Therefore, specific cut-off points were sought for the self-reported health status and SCS, by repeated computations looking for the scale scores with the largest effect size on the match-mismatch test. On the basis of these analyses, a match-mismatch variable was computed according the following rules:

— If SCS was > 3.08 and self-reported health status was => 3.07, the control condition was considered a mismatch while the three experimental conditions were considered a match.
— If SCS was <= 3.08 and self-reported health status was => 3.07, the emotions condition was considered a match and the other three conditions a mismatch.
— If SCS was > 3.08 and self-reported health status was < 3.07, the coping and the control conditions were considered a match, while the other two conditions were considered a mismatch.
— If SCS was <= 3.08 and self-reported health status was < 3.07, the combination and coping conditions were considered a match, while the other two conditions were considered a mismatch.

In this way a new dichotomous variable was computed and tested using an ANCOVA with quality of life after two months as dependent variable and quality of life at pre-test as covariate. The result of this test was significant, $F(1, 94) = 22.62$, $p < .001$. Thus, those who were matched had a higher quality of life than those who were mismatched. Cohen's d effect size was 0.74, indicating an almost large effect.

Discussion

The goal of this study was to test the effects of different types of social comparison information on the quality of life of cancer survivors. The main finding was, as expected, that the effects of the testimonials depended on the participants' self-reported health status and on individual differences in sensitivity to the social comparison information. The hypothesis was that in cancer survivors with a good health status and high SCS, quality of life would increase significantly after 2 months when they were confronted with social comparison information. In contrast, among those patients with a low SCS, this information would lower quality of life. Both parts of this Hypothesis 2 were confirmed. Another hypothesis was that in patients with poor health status, both effects would be reversed: in case of high SCS, quality of life would become lower, and in case of low SCS, quality of life would increase. Again, both parts

of this Hypothesis 3 were supported. The effect was most consistent for the type of social comparison information that combined negative emotions and coping strategies, which is informative on Hypothesis 4.

A possible explanation of these reverse effects in patients high and low in SCS is that patients low in SCS use the default comparison process in which they test for similarities (Mussweiler, 2003) and assimilate the information from others, whereas patients high in SCS use contrast processes to cope with the emotions that comparison activate. The outcome pattern we found is in line with the pattern Mussweiler (2001) found when similarity and dissimilarity testing were induced: This led to identification and contrast processes, respectively. Contrasting downward led to positive consequences and contrasting upward led to negative consequences. Assimilating downward led to negative consequences and assimilating upward to positive consequences. Although in the present field experiment we were not able to test the underlying processes, the pattern of quality of life was consistent with the above reasoning.

We reasoned that patients high in SCS are strongly moved by the social comparison information that is associated with cancer. To protect themselves, they are thought to distance themselves from the social comparison other. However, the literature suggests that, in addition, they already have a general inclination to contrast in social comparisons. It seems that people high in SCS look more closely at the social comparison information and they process the information centrally. Within this central processing, they have a comparison mindset; they compare themselves in detail, intensively, and vividly to the social comparison other. They seem to process the information locally; they zoom in on the comparison other and pay attention to details (Förster & Dannenberg, 2010). When someone looks closely, the standard of comparison seems more extreme (Morse & Gergen, 1970). As a result, an individual self-construal is activated (Cheng & Lam, 2007): They construe their self as separate from the other. The information from the comparison other is used as a standard against which the self is evaluated. Because of this, people can view themselves as unique and distinct; the self-evaluation moves away from the reference value (Collins, 1996; Mussweiler, 2003). When the focus is on the personal self, it is likely that contrast effects occur. Thus, besides that patients who are strongly moved by social comparison information on cancer want to protect themselves, they may also have the general inclination to contrast themselves in social comparisons.

In contrast, patients who are less sensitive to social comparison information have a more distal general look on the information. Because they mind less about social comparison, they look more at the gestalt when confronted with others; the information is processed globally (Förster & Dannenberg, 2010), with more of an interpretation mindset in which making sense of the social comparison information is the focus. The social comparison standard seems therefore less extreme, which leads to assimilation processes. Because of this global processing, the comparison others look similar at first glance and they assimilate more easily with the information of the comparison other. Therefore, the interdependent self-construal is more salient (Cheng & Lam, 2007); they feel more similar to the other. As a result, the presented social comparison information gets integrated into the self-representation (Förster et al., 2008).

One assumption underlying the first interpretation is that cancer survivors with a good health status receive the social comparison information as downward information, while those with a poor health status receive it as upward information, which is conceptualized here as the constraint effect. It was confirmed that patients with a relatively good health status made downward comparisons (this partly confirms Hypothesis 1). That the constraint effect could not be demonstrated for patients with a poor health status may be related to our measure. The measures of comparison direction were explicit while the comparison process may largely be automated and subconscious. Because the measure was explicit, first, it may activate additional motives to answer. For instance, biased or defensive memorizing and interpretation of information to maintain self-esteem (Sedikides & Green, 2004; Taylor & Brown, 1988) may have influenced the measurement. Second, the actual subconscious process may not easily be accessed. Thus, it may be that a different measure is needed to grasp the real direction of comparison directly, at least in those with a poor self-reported health status.

Our findings reveal that social comparison information can have detrimental effects on some people. When only main effects are considered, it might seem reasonable to assume that "it never hurts to listen to social comparison information." In the present study, however, we identified specific characteristics of people who were hurt by the information. Taylor et al. (2007) already anticipated possible negative effects of social comparison information in cancer patients based on individual differences, on theoretical grounds. The match-mismatch test revealed how serious the effects of giving mismatching information to individuals can be; the effect size was practically large. Although in health care practice and on the Internet testimonials of (former) patients seem to be presented uncritically and as if they cannot do any harm, it is plausible that this powerful social comparison information will have negative effects in subgroups of recipients. The findings of the present study draw our attention to possible side effects of psychosocial interventions. While side effects are investigated thoroughly and are taken seriously in medical treatments, in psychosocial treatment the possibility of side effects is mostly unknown and is not considered a problem. Therefore, studies on psychosocial interventions should include measures of individual differences that enable it to be determined how different types of information are processed and received.

The expectation was that the effects would differ according to type of comparison information, although no specific hypotheses were formulated. The results for type of comparison information are hard to interpret, although one finding stands out: The effects were mainly found and were stronger in the combination condition. Something about the combination of emotions and coping in this condition makes it especially powerful, for better and for worse. It may be that separation of these elements is artificial and less meaningful. It is also possible that the coping strategies provide a context for controlling the feelings provoked by recognition of the negative emotions in others for some cancer survivors. More research is needed here.

Possible Limitations

In interpreting the present findings, some specific study characteristics must be taken into account. We gave patients in the control condition a CD with relaxing guitar music with no text. Thus, in the control condition – as in the three experimental conditions – patients received a CD at home. Therefore, the conditions did not differ on this aspect. Some patients indicated, however, that they visualized a particular image while listening, exactly as presented in the coping condition. It is possible that this control condition was helpful to some patients and comparison with patients who received no CD would probably be more correct. This should be investigated in future research.

All participating cancer survivors responded to calls in the media. These volunteers had their own reasons for participating in this study; for example, to contribute to science or to feel recognized as a (former) cancer patient. We have no data on whether patients who decided not to take part in the study differed from the participants on variables related to the effects of social comparison information. One reason for not taking part in the study may have been the inclination to avoid the topic of cancer, which causes negative emotions. Although these cancer survivors may be much like the participants in our sample who scored high on SCS, it cannot be ruled out that their inclination would make them react differently to the social comparison information. Therefore, generalization of the present results to other cancer survivors should be made with caution. We might also consider generalization to patients who spontaneously visit websites about cancer or the psychosocial aspects of cancer. It is possible that the present results can be generalized to patients who do not avoid the topic of cancer.

In conclusion, a short, theory-based intervention communicating social comparison information influenced quality of life in cancer survivors. There was no main effect of condition; however, moderator analyses revealed that quality of life improved in some cancer survivors but decreased in others. The match-mismatch test revealed how strong the effect was; the effect size was almost large. We believe that the latter painful effect is often induced by psychosocial interventions, but that these effects are not detected because no theory-based moderator analyses are conducted. Our results stress that there is a lot to gain with smarter interventions that take more account of individual differences. The present findings may contribute to such a development in the classic social comparison research as well as in the clinical setting.

Chapter 3

Effects of the Source of Social Comparison Information on Cancer Patients' Quality of Life

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Effects of the Source of Social Comparison Information on Cancer Patients' Quality of Life[1]

Abstract

Life, following curative treatment, can be a struggle for former cancer patients. In this phase of their illness, social comparison information may help to improve a patient's quality of life. The objective of this study was to determine whether the effects of this information depend on the following two variables: (1) the individual's physical health and (2) the individual's sensitivity to social comparison. In the current study, the effects on a patient's quality of life were tested that occur when they are listening to a psychological oncological expert talking about cancer patients' experiences. Three different recorded interviews with experts were compared (on negative emotions, effective coping, or both), and individual differences were tested as moderators. In addition, the expert source conditions were compared with a condition in which the source was not an expert but a former patient. In a randomized field experiment, 154 Dutch former cancer patients (M_{age} = 55 years; 68% women) were assigned to one of the four conditions (three expert source and one former patient source condition). Quality of life was assessed after 2 months. The effects of the expert source conditions on quality of life depended on the participants' physical health (good vs. poor) and on the participants' sensitivity to social comparison (whether the recipient reacts with contrast or identification), as indicated by significant three-way interactions ($p < .001$). Depending on these two variables, one of the three expert source conditions was at least as effective as the former patient source condition. The results show that desired and undesired effects are found when individual differences relevant to the processing of intervention information are examined.

1 This chapter is based on: Brakel, T. M., Dijkstra, A., & Buunk, A. P. (2012[b]). Effects of the Source of Social Comparison Information on Cancer Patients' Quality of Life. *British Journal of Health Psychology, 17*(4), 667-681. doi: 10.1111/j.2044-8287.2012.02064.x

Effects of the Source of Social Comparison Information on Former Cancer Patients' Quality of Life

Recovered cancer patients often suffer from poor quality of life and, often, have a hard time afterwards. Quality of life is the subjective evaluation of how a person is doing, feeling, and functioning overall in life (Leventhal & Colman, 1997). One important way to gather information for such an evaluation is through social comparison: by learning about other people in similar circumstances (Buunk, 1995; Buunk & Gibbons, 2007; Schwartz & Sprangers, 1999).

The findings, of at least two studies, have shown that a patient's quality of life can be influenced by auditory social comparison information (Bennenbroek et al., 2003; Brakel, Dijkstra, Buunk, & Siero, 2012[a]). In both studies, actors – posing as former patients – talked about their experiences with cancer (testimonials). In practice, however, cancer patients are already regularly confronted with information about fellow patients in general, for example, by an expert in the oncological field. The purpose of the current study was, to determine how a former cancer patient's quality of life is affected by social comparison information provided by an expert. In addition, the effects of this expert information were compared with the effects of a testimonial from a former patient. We examined the influence of the individual characteristics that Brakel and colleagues (2012[a]) used in their study: the participant's physical health and their sensitivity to social comparison.

Social Comparison Direction and Physical Health

Whether social comparison information is beneficial or detrimental to a patient's quality of life depends somewhat on the direction of the comparison (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990). In this regard, a fellow patient can be perceived as an '*upward* comparison other', or as a '*downward* comparison other' (i.e., whether they are doing, feeling, and coping better or worse, respectively; Brakel et al., 2012[a]). Whether a comparison target is considered upward or downward, partially depends on the person's own physical health (e.g., the degree of physical ability or disability; Taylor&Lobel, 1989; Taylor, Wood, & Lichtman, 1983). Patients may, for instance, search for dimensions on which the 'comparison other' is worse off in order to enhance their view on their own position, and ignore parts of the information that are unfavourable to this view. However, reality puts constraints on the extent to which people can shift the position of the 'comparison other', up or downward. This constraint on social comparison in general, may also determine the outcome of social comparisons with former cancer patients (Brakel et al., 2012[a]; Van der Zee et al., 1996).

Social Comparison Sensitivity

In addition to the effect of the person's own physical health on the social comparison outcome, individual differences in affective responsiveness to social comparison information, may also influence the processing of social comparison information (Bogart, Benotsch, & Pavlovic, 2004; Hobermann & Lewinsohn, 1985). In the current study, we conceptualized this trait as SCS (Brakel et al., 2012[a]). Literature on social comparison identifies some people as those who respond with a greater or lesser degree of sensitivity to other people's good fortune or failures (Diener & Srull, 1979; Gibbons, 1986; Lyubomirsky & Ross, 1997; Lyubomirsky, Tucker, & Kasri, 2001; McFarland & Miller, 1994; Swallow & Kuiper, 1988; Weary, Elbin, & Hill, 1987). These people seem sensitive and open to this kind of information in normal everyday life. They intensively and vividly identify with the social comparison target. However, when the subject of a comparison is relevant and threatening – as is the case with cancer – they activate self-regulation processes to cope with the information (Brakel et al., 2012[a]). They engage in psychological 'contrasting'. Thus, when the topic is threatening, an individual sensitive to social comparison becomes a 'contraster'. Such a person focuses on the differences, between themselves and the 'comparison other', in order to avoid the disturbing emotional impact of the information, and to down-regulate the strong emotions that are activated. Downward contrast may make the person feel better off compared to the other ('I am different in a positive sense'), and lead to positive feelings (Stanton, Danoff-Burg, Cameron, Snider, & Kirk, 1999; Suls, Marco, & Tobin, 1991; Van der Zee et al., 1996; Wills, 1981) as well as a related increase in quality of life. Yet, with an upward comparison, contrasting may make the person feel worse off (Carmona, Buunk, Peiró, Rodríguez, & Bravo, 2006).

People who are less sensitive to social comparison are less moved by social comparison information (see Ahrens & Alloy, 1997). They engage in similarity testing, which is the default social comparison process, according to Mussweiler (2003). They assimilate social comparison information more easily and integrate it into their self-representation (Förster, Liberman, & Kuschel, 2008). In people, less sensitive to social comparison, the information brings about less emotional turmoil and reactivity, but because they do process the information, some psychological assimilation occurs. The individual, less sensitive to social comparison, easily identifies with the 'comparison other'. For these 'identifiers', upward comparison leads to positive feelings and an increase in quality of life: the patients feel that they can improve and may become more like the 'comparison other' (Stanton et al., 1999; Taylor & Lobel, 1989). A downward comparison probably elicits negative feelings and a decrease in quality of life: the patients feel similar and perceive the possibility of deteriorating as well (Buunk & Ybema, 1997; Carmona et al., 2006).

SCS might be an important moderator when it comes to social comparison in the context of cancer, because it determines whether a patient will contrast, or identify, when engaging in comparison with others. Our *first hypothesis*, therefore, focused on the interaction between a former patient's physical health and their SCS. This hypothesis was also based on

the results of Brakel et al. (2012[a]). We expected that patients, sensitive to social comparison, would contrast, whenever possible, when confronted with information about other patients' experiences with cancer. We expected patients in good physical health to contrast downward, which would increase their quality of life (Hypothesis 1a). We expected patients in poor physical health to contrast upward, lowering their quality of life (Hypothesis 1b). Furthermore, we expected patients, less sensitive to social comparison, to easily identify with other cancer patients. Patients in good physical health were expected to identify downward, lowering quality of life (Hypothesis 1c). Those in poor physical health were expected to identify upward, and notice that they could adjust upward, increasing their quality of life (Hypothesis 1d).

The Expert Source Versus the Patient Source

The strength of the effect of perceived physical health and SCS, possibly, depends on the source that provided the social comparison information. Information provided by an expert is probably perceived as more reliable by some patients, because it comprises information on general patterns of behaviours and outcomes in patients. This information may be considered more general and less idiosyncratic compared to information provided by one individual patient, and therefore, more applicable to the recipient. Thus, it might have a stronger effect on quality of life. We have formulated a corresponding exploratory *second hypothesis*: depending on differences in perceived physical health and SCS, the effects of social comparison information on quality of life, may differ, depending on whether the social comparison information is provided by an expert or a former patient.

Type of Social Comparison Information

The type of social comparison information may also make a difference. At least two relevant types of social comparison information can be distinguished in the context of former cancer patients (Bennenbroek, Buunk, Van der Zee, & Grol, 2002): (1) information about negative emotions that former patients experienced due to cancer and (2) information on how former patients coped.

Social comparison information on both negative emotions, which are essentially intense, and coping, which is mainly instructive, can be meaningful to former patients (Buunk et al., 2009), and has the potential to increase their quality of life (Bennenbroek et al., 2003; Brakel et al., 2012[a]). In normal personal communication, both types of information are provided together (Silver, Wortman, & Crofton, 1990). In this study, we examined the impact of different types of social comparison information on quality of life, in a dismantling design. We have formulated the exploratory *third hypothesis*: Different types of social comparison information (combined/negative emotions/coping) may have different effects on quality of life.

Method

Design

Former cancer patients responded to advertisements in local newspapers and on websites. They were told that the aim of the study was to develop new patient information for people who had just completed their treatment. Participants, who reported at the pre-test that they had an incurable form of cancer, were excluded from participation, because the social comparison information was not designed for terminal guidance. Ethical approval for this study was obtained from the ethics committee of the Medical Ethical Evaluation Committee of the University Medical Centre Groningen (METc 2008/216).

Participants were randomly assigned to one of three expert source conditions or the patient source condition in a between-subjects design. In the expert source conditions, participants listened to audio recordings of an expert giving social comparison information on cancer patients' experiences during their recovery. The first expert source condition focused on patients' negative emotions: feeling insecure, afraid, ashamed, and angry (emotions condition). The second condition focused on coping strategies used by patients: actively handling the situation, palliative reaction, seeking social support, and reassuring thoughts (coping condition). The third condition combined patients' emotions and their coping strategies (combination condition). In the patient source condition, participants listened to an audio recording of a former patient with the content adapted to the results of the study by Brakel and colleagues (2012[a]). Participants in the patient source condition received the most suitable recording for enhancing quality of life (emotions or coping or the combination), based on their perceived physical health and their SCS. The contents of these matched recordings were previously examined and positively evaluated in a pilot study (see Brakel et al., 2012[a]).

The expert, as well as the patient script, covered eight topics, including fatigue, ruminating thoughts, and fear of reoccurring cancer. The different scripts were as similar as possible with respect to the topics addressed, the order of the topics, the use of language, and the total length of the interview (approximately 20 min).

Procedure

After giving written consent, the participants completed a pre-test, consisting of demographical and medical questions, as well as questions to measure the participant's quality of life, SCS, and physical health. About 1 week later, having been randomly assigned to a condition, they received a condition-specific audio CD. The CDs in the three expert source conditions contained an interview with a female expert in the psycho-oncological domain. She spoke about the experiences her patients had during recovery. The audio file in the patient source condition contained an

interview with a patient, who spoke about his/her own experiences during recovery. Participants were instructed to listen, at least once, to the CD they had received, and to fill in a short questionnaire afterwards. Three weeks (the first post-test) and 2 months (the second post-test) after receiving the CD, they completed follow-up questionnaires (the data from the second post-test have been reported in this study). The second and last post-test consisted of medical questions, and questions to determine the participant's quality of life and physical health.

Individualized Information

In all four conditions, the information was partly individualized to induce similarity and ensure personal relevance of the information (Dijkstra, 2008). Thus, participants in the expert condition heard about patients with the same gender and the same type of cancer. To achieve this, different pieces of information were recorded and merged using a computer program to form one coherent interview in an auditory format. In the patient source condition, age was also adapted to the individual recipient (resulting in 13,156 possible combinations that could be adapted to the individual).

Questionnaires

Manipulation check. The participants completed a short questionnaire after listening to the CD. They were asked to rate the content of the CD on comprehensibility, clarity, novelty, reliability, credibility, length, and recall: for instance, 'To what extent did you think the information was reliable?' Answers ranged from *not at all* (1) to *completely* (7) on a 7-point scale.

Quality of life. To determine quality of life, three existing scales were used and combined. A subscale of the EORTC QLQ-C30 (version 3.0; Scott et al., 2009) was used to assess global health status and quality of life (items 29 and 30): for instance, 'How would you rate your overall health during the past week?' Answers ranged from *very poor* (1) to *excellent* (7) on a 7-point scale. Next, the Linear Analogue Self-Assessment scale (LASA overall; Locke et al., 2007) was used. Ratings were made along a line, with on the left *lowest possible quality* and on the right *highest possible quality*. Last, participants filled out Cantril's Ladder (Cantril, 1965). They rated their current quality of life on a ladder ranging from *worst imaginable quality of life* (0) to *best imaginable quality of life* (10). An additional question was, 'If you compare yourself with others, of the same age and sex, with a similar type of cancer, how do you think you are currently doing?' Possible answers ranged from *much worse* (1) to *much better* (7) on a 7-point scale. To compute the composite quality of life score, all scores were converted to a scale of 1 to 7 and then averaged ($\alpha_{pre} = .86$, $\alpha_{post} = .92$).

Social comparison sensitivity. Social comparison sensitivity was measured using the Identification Contrast Scale (Van der Zee, Buunk, Sanderman, Botke, & Van den Bergh,

2000), as advocated by Brakel and colleagues (2012[a]). A composite of all items was used. This social comparison sensitivity scale required participants to self-report the extent to which they experienced positive or negative emotions in response to different social comparison targets. Higher scores indicated an intensified affective responsiveness and more emotions, thus a stronger sensitivity to social comparison. The questionnaire consisted of 12 items that ranged from *strongly disagree* (1) to *strongly agree* (5) on a 5-point scale: for instance, 'When I think about others who are better off, I feel frustrated about my own situation' ($\alpha_{pre} = .81$).

Perceived physical health. To assess the perceived physical health of the participants, we asked them to respond to 28 items relating to their physical health. These items were based on the EORTC QOL-C30. All questions started with the phrase, 'During the past week . . . ' and were followed by the second part: for example, 'I was in pain' or 'I was tired'. Answers ranged from *not at all* (1) to *very much* (7) on a 7-point scale ($\alpha = .93$).

Drop Out and Sample Characteristics

Several identical calls to participate were placed in regional newspapers and on cancer-related websites. A total of 291 people responded and received the first questionnaire. Not all of these people met the criteria or returned the first questionnaire. Due to a technical problem, the data of 13 participants could not be retrieved. Of the 238 participants who filled in the pre-test, 188 filled in the final questionnaire (79%). A requirement for participation was that the participant's treatment for cancer had ended, and had done so, no longer ago than 12 months prior to the commencement of the study. Thirty-seven participants were removed from the dataset for this reason. The remaining 154 participants were distributed over the conditions as follows: expert emotions: $n = 37$, expert coping: $n = 45$, expert combination: $n = 34$, and patient source condition: $n = 38$.

The remaining sample consisted mostly of women (67.6%). Ages varied from 27 to 83 years ($M_{age} = 55$, $SD = 11.11$). Most participants had a high level of education (48.3%), were married or had a partner (80%), and were not religious (53.5%). All participants were Caucasians. They had received treatment for a wide variety of cancer types. The most prevalent form was breast cancer ($n = 70$). See Table 1 for cancer-related characteristics.

Table 1. Most Prevalent Cancer Types of the Sample and Time Since Treatment

	Full sample		*Expert Emotions*		*Expert Coping*		*Expert Combination*		*Patient Matched*	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Most prevalent cancer types										
Breast Cancer	70	45.5	17	45.9	21	46.7	14	41.2	18	47.7
Non-Hodgkin	7	4.5	2	5.4	2	4.4	0	0.0	3	7.9
Colon Cancer	23	14.9	5	13.5	7	15.6	7	20.6	4	10.5
Hodgkin	4	2.6	1	2.7	2	4.4	0	0.0	1	2.6
Lung Cancer	6	3.9	2	5.4	3	6.7	0	0.0	1	2.6
Time since treatment										
Months	5		5		5		5		4	

Results

Randomization Check and Attrition Analyses

The patients, in the three expert source conditions and the patient source condition, did not differ significantly on demographic variables, or in the other data received from questionnaires administered prior to the manipulations. Univariate analyses of variance (ANOVA) showed some significant differences ($p < .05$) between respondents and non-respondents to the second post-test. Non-respondents had a lower quality of life at the pre-test, were younger, and had perceived cancer as more life-threatening. The disease influenced their lives more intensely, and their self-esteem was lower. They were more uncertain about how to deal with cancer, and their physical health was worse. During the pre-test, non-respondents experienced more negative and fewer positive emotions. Non-respondents were not significantly different from those who completed all three questionnaires regarding gender, type of cancer, personal situation, daily activities, religion, treatment received in hospital, and health prospects ($ps > .13$). The numbers of non-respondents did not differ significantly between the four conditions ($p = .22$).

Manipulation Check Evaluation

ANOVAs were used to evaluate the manipulations. Based on self-reports, it was found that patients did not differ significantly in how well they had listened to the content of the CD under the different conditions, $F(3, 150) = 1.55$, $p = .20$, $\eta_p^2 = 0.16$. On average, 97.4% of the patients indicated having listened to the entire interview: they scored *listened completely* (1) on a 7-point

scale. The three expert source conditions did not differ with regard to comprehensibility, clarity, novelty, reliability, credibility, appreciation of the length of the interview, difficulty listening to the CD, and interest in the interview (*ps* > .20). However, there were differences between the expert source conditions and the patient source condition. The last condition was considered less comprehensible, $F(3, 146) = 4.23$, $p = .007$; less reliable, $F(3, 150) = 3.93$, $p = .010$; less credible, $F(3, 148) = 2.58$, $p = .056$; and less interesting, $F(3, 147) = 3.64$, $p = .014$ compared to the interviews in the three expert source conditions.

Preparatory Statistical Analyses

For exploratory reasons, we tested the positive SCS subscale (SCSpos) and the negative subscale (SCSneg), in addition to the total scale in which the 12 items concerning positive and negative emotions were combined. The strongest predictor was the SCSpos. Correcting the analyses using the SCSpos for the influence of SCSneg showed no difference in the results. Therefore, SCSpos was used as the parameter of SCS in all following analyses.

Comparing the expert source conditions. We predicted that the effects of the social comparison conditions on quality of life would depend on SCS and the physical health of patients. A three-way interaction (Condition × SCS × Physical Health) for the three expert source conditions was computed using ANCOVA. This interaction was entered as the highest order interaction in a saturated model with post-test quality of life as the dependent variable (in this and further analyses with quality of life, pre-test quality of life was entered as covariate). The three-way interaction with SCS was significant, $F(2, 90) = 8.64$, $p < .001$, $\eta_p^2 = 0.16$. As expected, the effects of the social comparison information depended on a patient's SCS and physical health.

Main Analyses

Expert source conditions. To investigate the meaning of the three-way interaction in the expert source conditions, a model was created for two groups: a group scoring high and a group scoring low on perceived physical health. This was done by adding one standard deviation and subtracting one standard deviation, respectively, from the mean-centred scores on the patient's perceived physical health, using the complete dataset, according to the procedure outlined by Cohen, Cohen, West, and Aiken (2003). In the context of the communication about cancer, we distinguish a group of contrasters (with a high score on the SCS Scale) and a group of identifiers (with a low score on the SCS Scale) that were modelled in a similar manner. Figures 1 and 2 show, respectively, the mean scores on quality of life in the three expert source conditions for patients, with either a good or a poor physical health, and for both the contrasters and identifiers.

Good physical health. For former cancer patients, in good physical health, the Condition × SCS interaction with post-test quality of life as dependent variable was significant, $F(2,$

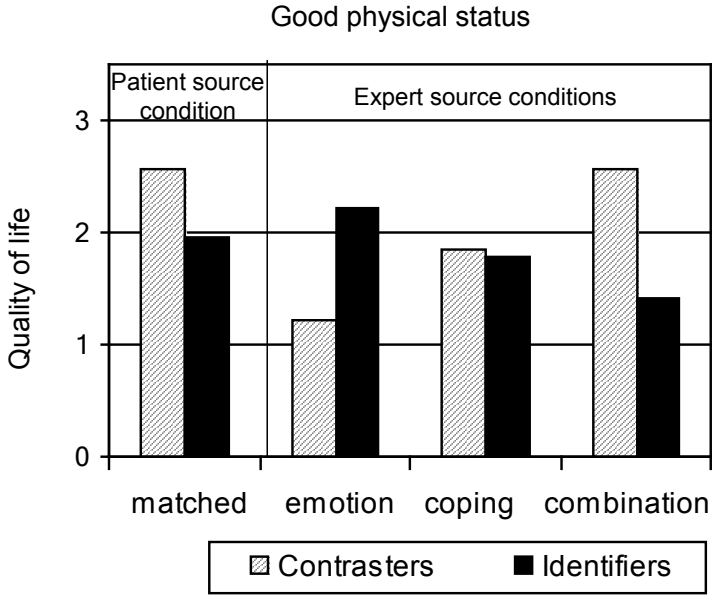

Figure 1. Quality of life for patients across conditions with a good physical health, distinguished in contrasters and identifiers.

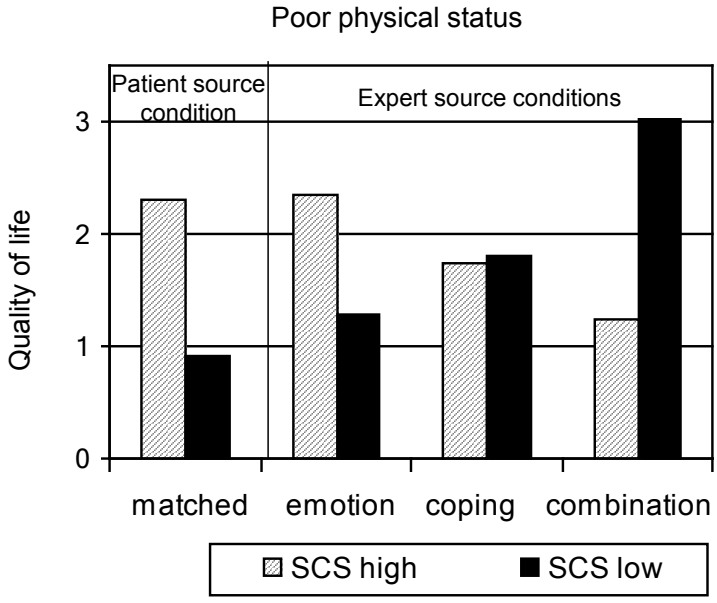

Figure 2. Quality of life for patients across conditions with a poor physical health, distinguished in contrasters and identifiers.

90) = 5.15, $p = .008$, $\eta_p^2 = 0.10$. Contrast for contrasters showed that patients, in the combination condition ($M = 2.38$), had a significantly higher quality of life than those in the emotions condition ($M = 1.03$), $F(1, 90) = 9.88$, $p = .002$, $\eta_p^2 = 0.10$, while significance was approached in the coping condition ($M = 1.65$), $F(1, 90) = 3.02$, $p = .086$, $\eta_p^2 = 0.03$.

Contrast for identifiers showed that only patients in the combination condition ended up with a marginally lower quality of life (M = 1.23) than patients in the emotions condition ($M = 2.03$), $F(1, 90) = 3.48$, $p = .066$, $\eta_p^2 = 0.04$.

Poor physical health. For patients in poor physical health, the Condition × SCS interaction was also significant, $F(2, 88) = 5.28$, $p = .007$, $\eta_p^2 = 0.11$. Contrast for contrasters showed only a marginally lower quality of life in the combination condition ($M = 1.10$) compared to the emotions condition ($M = 2.21$), $F(1, 90) = 3.82$, $p = .054$, $\eta_p^2 = 0.04$.

Contrast for identifiers showed that the combination condition ($M = 2.89$) led to a significantly higher quality of life compared to the emotions condition ($M = 1.13$), $F(1, 90) = 9.34$, $p = .003$, $\eta_p^2 = 0.09$, and compared to the coping condition ($M = 1.67$), $F(1, 90) = 7.03$, $p = .008$, $\eta_p^2 = 0.08$.

Expert source conditions compared with the patient source condition. To test if any of the expert source conditions differed from the patient source condition for patients with a certain level of SCS and physical health, the same contrast analyses were re-run using all four conditions. Figures 1 and 2 show the mean scores on quality of life for all four conditions.

Good physical health. For former cancer patients in good physical health, the Condition × SCS interaction with post-test quality of life as dependent variable was significant, $F(3, 119) = 4.13$, $p = .008$, $\eta_p^2 = 0.09$. Contrasts for contrasters showed that patients in the patient source condition ($M = 2.66$) had a significantly higher quality of life than patients in the emotions condition ($M = 1.22$), $F(1, 119) = 13.26$, $p < .001$, $\eta_p^2 = 0.10$, as well as patients in the coping condition ($M = 1.85$), $F(1, 119) = 4.09$, $p = .045$, $\eta_p^2 = 0.03$. Among identifiers, no significant contrasts were found between any of the expert conditions and the patient condition, ps > .12; η_p^2 all < 0.02.

Poor physical health. For patients in poor physical health, the Condition × SCS interaction was also significant, $F(3, 119) = 5.67$, $p = .001$, $\eta_p^2 = 0.13$. For contrasters, a significantly higher quality of life was observed in the patient source condition ($M = 2.30$) compared to the combination condition only ($M = 1.24$), $F(1, 119) = 5.51$, $p = .021$, $\eta_p^2 = 0.04$. For identifiers, only those in the combination condition ($M = 3.03$) had a significantly higher quality of life than those in the patient source condition ($M = 0.91$), $F(1, 119) = 10.52$, $p = .002$, $\eta_p^2 = 0.08$.

Discussion

The goal of this study was to test the effects of social comparison information on the quality of life of former cancer patients, when this information is presented by a psycho-oncological expert. Three different types of expert interviews were tested: one about the negative emotions experienced by cancer patients, one about ways to cope with having cancer, and one combining negative emotions and coping strategies.

The findings were largely in accordance with hypothesis 1 (a, b, c, and d): an interaction effect was expected between the patients' physical health, which was responsible for the comparison direction (upward or downward), and a patient's sensitivity to social comparison, which was responsible for contrast or identification with 'comparison others'. Patients sensitive to social comparison contrasted when they listened to the combination condition interview. When their perceived physical health was good and the 'comparison other' seemed to be worse off, contrasting was beneficial and led to an enhanced quality of life 2 months later. When their physical health was poor, the 'comparison other' served as an upward target and contrasting with them led to a diminished quality of life. Patients less sensitive to social comparison adapted to this: when they were in good physical health, the interview served as a downward comparison, leading to a lower quality of life after adaptation. When they were in poor physical health, they adapted in an upward manner and quality of life improved. The combination condition, in particular, led patients, sensitive to social comparison, to contrast and patients, less sensitive to social comparison, to identify. These data replicate earlier findings on the effects of the three different types of social comparison information (emotions, coping, and combined), where the source was a fellow patient instead of an expert. It seems that the mix of social comparison information on emotions and on coping is essentially different from each of the two separate types of information (emotions or coping). Future studies should further unravel what synergy is responsible for this particular quality.

Expert Source Conditions Compared with the Patient Source Condition

Another goal of this study was, to compare the expert source conditions with a patient source condition in which the patients received a matched recording of an interview with a fellow patient that was considered best suited to them, based on the earlier research results of Brakel et al. (2012[a]). As expected (Hypothesis 2), for some patients, namely for patients in poor physical health and less sensitive to social comparison, listening to an expert interview, that combined information on emotions and coping, was more beneficial than listening to a matched fellow-patient interview; quality of life increased 2 months after listening. A possible explanation for this,

is that these patients consider expert information, about the experiences of many patients, to be more reliable and credible, than information provided by only one fellow patient. Patients less sensitive to social comparison possibly have a more detached, more general view, and because of this global processing, they assimilate the information only when it is generalized.

For patients in poor physical health and sensitive to social comparison, quality of life decreased in the expert combination condition compared with the patient source condition. For these upward comparing patients, the information, provided by the expert, might strike a nerve. They compare themselves in more detail and more intensively with the generalized information about lots of other patients, which has more impact (Locke, 2007). When the topic is about cancer, they tend to contrast themselves with the social comparison target in order to down-regulate the negative emotions caused by the vivid social comparison.

The SCS-measurement

The core to people, that are highly sensitive to social comparison, is founded in their vivid and detailed processing of information. One important parameter of this, is the strength of the emotions people experience in response to normal everyday social comparison. Although the actual SCS measurement that was used in this study comprised a measurement of the strength of positive emotions, we argue that this measurement is a parameter of the underlying sensitivity. It is possible that people who report stronger positive emotions in general in response to everyday social comparison information, experience more negative emotions when they are confronted with an extreme topic, such as cancer. It might be argued that people who are sensitive to everyday comparison and respond to it with strong negative emotions, are more used to these negative emotions: they might be less inclined to contrast in order to reduce the impact of the comparison. Further research may be needed to differentiate between people who 'normally' react with positive emotions and those who react with negative emotions.

Contrast Versus Identifying

Formally formulated, when confronted with social comparison information on cancer, participants, who scored high on our SCS measurement, were thought to have a higher chance of contrasting themselves, while participants who scored low on the SCS measurement were thought to have a higher chance of identifying themselves. This expectation was based on an earlier study on social comparison by Brakel et al. (2012[a]) and our present data are in accordance, although we did not specifically assess these processes in the present study.

Detrimental Effects of Social Comparison

Our findings reveal that social comparison information can have detrimental effects on some people. When only main effects are considered, it might seem reasonable to assume that hearing about the experiences of others cannot be harmful. In the current study, however, we identified the characteristics of people whose quality of life deteriorated after receiving certain social comparison information. It is plausible that comparison information, given by experts on the internet, or during actual health care will have negative effects on certain subgroups of the recipients. The findings of the present study draw attention to possible side effects from psychosocial interventions. These interventions should, therefore, measure, and take into account, the individual differences that enable them to determine how different types of information are processed and received.

Possible Limitations

All participating former cancer patients responded to calls in the media. These volunteers had their own reasons for participating in this study, for example, to contribute to science. Those who chose not to participate had their reasons too, for example, to avoid the topic of cancer and the negative emotions it causes. Therefore, generalization of the present results towards former cancer patients, in general, should be made with caution. We might consider generalization of the present results towards patients who spontaneously visit websites about cancer. The present study was not explicitly designed to test source effects (expert vs. fellow patient), but to compare the expert source conditions with a matched patient source condition. Therefore, a standardized test of the effects of different sources is still needed. Of interest was the finding that the social comparison information in the patient source condition was rated overall as less credible, less reliable, and less interesting. It is not clear what caused this effect, but it might reflect the notion that information from an expert is perceived as more generalizable and more valid. Again, a more stringent test of the source is needed.

Conclusion

In conclusion, a short, theory-based intervention, communicating social comparison information, influenced quality of life in former cancer patients. Moderator analyses revealed that quality of life improved in some former patients, yet decreased in others. Our results stress the need for smarter interventions that take individual differences into greater account.

Chapter 4

Targeting Cancer Patients' Quality of Life through Social Comparison: A Randomized Trial

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Targeting Cancer Patients' Quality of Life through Social Comparison: A Randomized Trial[1]

Abstract

Former cancer patients' quality of life can be improved by offering social comparison information. Whether patients, however, benefit from the information may depend on how negative they perceive their present and their future. We conducted a randomized experimental field study with a pre- and post-measurement. Dutch former cancer patients – recruited through different media – were assigned to a social comparison intervention condition or a no-intervention control condition (experimental condition $n = 62$; control condition $n = 88$; $M_{age} = 52$ years). In the intervention condition, patients received a 20 min computer-tailored interview in audio format. Patients' present perceived life threat and future health expectations were measured at pre-test. Main outcome measures: Quality of life and life satisfaction after 2 months were the outcome variables. The intervention increased life satisfaction only in patients who experienced a high present life threat ($\eta_p^2 = .08$) and in patients who had negative future health expectations, the intervention increased quality of life ($\eta_p^2 = .05$). Not all patients did benefit from the intervention; for some patients, the social comparison intervention was even detrimental. Moderator analyses seem necessary to evaluate psycho-social interventions for cancer patients.

1 This chapter is based on: Brakel, T. M., Dijkstra, A., & Buunk, A. P. (2014). Targeting cancer patients' quality of life through social comparison: a randomized trial. Psychology and Health. doi: 10.1080/08870446.2014.901514

Targeting Cancer Patients' Quality of Life through Social Comparison: A Randomized Trial

The quality of life of cancer patients who are in the recovery phase of their illness is under constant pressure. Therefore, several psychosocial interventions have been developed that aim to increase the subjective quality of life of cancer patients. One type of intervention applies social comparisons information to increase quality of life (Bennenbroek et al., 2003; Brakel, Dijkstra, Buunk, & Siero, 2012; Buunk et al., 2009). In these specific social comparison interventions, former cancer patients are exposed to an audio file presenting a testimonial of a fellow patient. These studies show that, even after several months, exposure to social comparison information increased the quality of life of some patients. Individual differences in self-reported health status, social comparison sensitivity and neuroticism moderated the effects (Brakel, Dijkstra, & Buunk, 2012; Brakel, Dijkstra, Buunk, et al., 2012; Buunk et al., 2009).

In the current study, evidence-based social comparison intervention package is tested based on the findings in two of our earlier studies (viz. Brakel et al., 2012; Brakel, Dijkstra, Buunk, et al., 2012). It is expected that the effect of this composed intervention will depend on individual differences: individual differences in how former patients perceive their present and their future health are expected to moderate the effects of the social comparison intervention on their quality of life and life satisfaction.

Quality of Life and Life satisfaction

Quality of life and life satisfaction are considered to be psychological constructs based on subjective perceptions of situations or experiences. Importantly, individuals can (partly) influence these perceptions in directions they desire. This influence can be conceptualised, for example, as dissonance reduction (Festinger, 1957), optimistic bias (Stanton, Danoff-Burg, Cameron, Snider, & Kirk, 1999; Taylor & Brown, 1988; Weinstein, 2003), motivated inference (Kunda, 1987) and coping appraisal (Schlatter & Cameron, 2010). These kind of mechanisms help people construct their own reality. In addition, social comparison processes can help people construct a new perspective on their own situation (Stenner, Cooper, & Skevington, 2003). By relating one's personal situation to the situation of someone else, in a way that fits one's own needs, people can exert influence on the perception of their reality, and subsequently, on their quality of life. via social comparison one's own experience is seen as relative to another's experience: relatively better, similar or worse (Aspinwall & Taylor, 1993). Therefore, interventions that provide social comparison information can be expected to contribute to former cancer patients' perception of their situation and their subsequent quality of life.

It is, however, expected that not all patients will benefit equally from this type of intervention. In this paper, we argue that social comparison information is especially effective in increasing the quality of life and life satisfaction of patients who have a negative perspective on

their situation; in those who already have a positive outlook, the social comparison information will have little benefit (Taylor et al., 2007). In this study, we distinguish between patients' perspectives on their present situation and on their expected future situation.

Concerning their present situation, patients may perceive a certain life threat in the present which is negatively related to quality of life (Goldring, Taylor, Kemeny, & Anton, 2002; Laubmeier & Zakowski, 2004) and life satisfaction. If patients experience a present threat to their life, they may become motivated to avoid this negative state by mentally enlarging the distance between the current state and the feared outcome (Scheier & Carver, 2003) by using psychological strategies, for instance, wishful thinking or functional denying/ignoring of threatening information that is inconsistent with positive affect (Koller et al., 2000). Social comparison information may also contribute to this process, for example, by showing that similar people, who were even worse off, are still alive years later.

Concerning their future situation, patients may have construed a perspective of what will come. People may, for example, adhere to a pessimistic perspective (Hoorens & Buunk, 1993; Klein & Helweg-Larsen, 2002) about their health, which may lower their subjective quality of life (Koller et al., 2000; Scharloo et al., 2010). One way to feel better about one's situation is to construe the future as positive. Even when the present is experienced as negative, imagining a positive future may provide people with hope and optimism. This can be accomplished by using psychological strategies similar to those used to construct a bearable present. Social comparison information may also contribute to forming positive health expectations, for example, by showing that similar cancer patients experienced a positive health outcome after some time.

As mentioned above, we hypothesise that social comparison information will not increase quality of life and life satisfaction in all patients. More specifically, the hypothesis is that only patients who have not accomplished yet to mentally construct a positive perspective on their present or future – those experiencing a high present life threat or having a negative future health expectation – will benefit from the social comparison intervention. In those who are already positive about their present or future, there is little room for improvement, and the social comparison intervention will have no effects. Thus, we expect that perceived life threat and health expectations will moderate the effects of the social comparison intervention package on quality of life and life satisfaction.

In the present study, we tested the effectiveness of a social comparison intervention package that provides the information through the auditory channel only (i.e. in an interview format). Former cancer patients in the intervention condition listened to social comparison information that was adapted to individual differences that proved to moderate quality of life and life satisfaction in earlier studies (Brakel et al., 2012; Brakel, Dijkstra, Buunk, et al., 2012). The first goal of this study was to compare the effects of this tailored intervention to the effects of no intervention, and to test whether the effects depend on the patients' perspectives regarding their present life threat and future health (see the above hypothesis). An additional goal of this study was to investigate the relevance of the expected moderation effects in terms of effect sizes by conducting a match–mismatch test.

Method

Design & Procedure

Ethical approval for this study was obtained from the ethics committee of the Medical Ethical Evaluation Committee of the University Medical Centre Groningen (METc 2010/037). To test the hypothesis, we conducted a theory-based randomized field experiment among cancer patients who had finished their treatment in the hospital (operation, chemotherapy or radiation therapy). Patients who had suffered from different types of cancer were recruited via ads in local newspapers and on several health and cancer-related websites where they were asked to sign in on a webpage. The inclusion criteria were as follows: the hospital treatment had to be completed within the last 12 months and patients had to be able to understand Dutch as we conducted this study in Dutch. They were included regardless of whether their particular cancer was an initial cancer or a recurrence. The participants – recruited from March 2010 up to December 2010 – were told that the aim of this study was to develop new information for patients who had just completed their cancer treatment. There was a computerized random assignment to either an experimental condition (social comparison intervention) or a control condition (no intervention).

All participants were informed of the possibility that they could be asked to listen to an audio file containing new information for patients. Only patients assigned to the experimental condition received this auditory information. After giving written consent, the participants completed an online pre-test questionnaire. The questions measured demographic variables, medical (history) variables and psychological variables (an extensive description of the measurements is given in the subsection 'Questionnaires'). Next, the patients assigned to the experimental condition were asked to listen, at least once, to the audio file with a duration of approximately 20 min. Then, they received a manipulation check immediately. Patients assigned to the control condition completed the same pre-test questionnaire. Two months later (the time period in which the effects of the social comparison intervention were detectable in the two earlier studies: Brakel et al., 2012; Brakel, Dijkstra, Buunk, et al., 2012), all participants were invited to fill out the post-test questionnaire. They received an e-mail which contained a link to the questionnaire. When the answers were not received within two weeks, a reminder e-mail was sent. This second questionnaire again consisted the measures of quality of life and life satisfaction.

Adapted and Individualized Audio File

To enhance the effects of the social comparison information, the audio file with social comparison information was adapted to individual differences in self-reported health status and social comparison sensitivity on the basis of the results of two earlier studies (see Brakel et al., 2012;

Brakel, Dijkstra, Buunk, et al., 2012). To this end, different audio files were developed and recorded under supervision of a professional director. The content of an audio file in the intervention condition was based on the decision rules as displayed in Table 1. In this way, all patients in the intervention condition received the best possible script for enhancing their quality of life based on the data of two earlier studies (Brakel et al., 2012; Brakel, Dijkstra, Buunk, et al., 2012). Thus, the decision rules that underlie the composed audio file in the intervention condition are based on these studies and comprise contemporary 'computer-tailoring' of information, called adaptation or matching (Dijkstra, 2008).

Table 1. The Social Comparison Information was Adapted to the Participant According to the Decision Rules as Described Below

Pre-test self-reported health status (scale score)	Pre-test social comparison sensitivity (scale score)	Adapted social comparison information
High (< 3.07)		Patient emotions
Low (>= 3.07)	Low (<= 3.08)	Patient emotions + coping
Low (>= 3.07)	Middle (> 3.08 & <=3.5)	Patient coping
Low (>= 3.07)	High (> 3.5)	Expert emotions + coping

The tailored audio file that patients received consisted of a testimonial in an interview format. The interview was either between an interviewer and two professional actors posing as fellow former cancer patients talking about their own experiences or between an interviewer and one actor posing as an oncological expert talking about her patients' experiences in general. In addition, the focus in the interview was either on experienced emotions associated with cancer, on coping strategies on how to handle the situation or on a combination of emotions and coping. The patient interview contained an introductory topic and seven additional topics that seemed important to patients during their recovery phase (Brakel, Dijkstra, Buunk, et al., 2012). The expert interview contained an introductory topic and four out of the seven additional topics that were chosen by the recipient. The topics addressed were: fatigue, ruminating thoughts, fear of recurrence of the cancer, physical dysfunction, setback after treatment for cancer and uncertainty concerning the future and value change (other things in life become important and/or appreciated).

The audio file was also partly individualized to standardise the personal relevance of the interview (Dijkstra, 2008): the expert spoke about patients of the same gender that had the same type of cancer as the participant. Similarly, in the fellow patient interview, gender, type of cancer and age were used to tailor the information. To compose the final adapted and individualized audio file, different pieces of audio recordings were merged using a computer program to form one single coherent interview in an audio format. Patients received the audio interview immediately after finishing the online pre-test.

Questionnaires

Pre-test questionnaire

Demographic and cancer related variables. The following demographic variables were measured: sex, age, marital status, education and religion. Cancer-related variables that were measured were cancer type, type of treatment and number of months since treatment.

Dependent variables. *Quality of life* was the first outcome variable. The quality of life scale was the same as used by Brakel et al. (2012). It was composed of the following four different elements. First, a subscale of the EORTC QLQ-C30 was included (version 3.0; Scott et al., 2009) assessing global health status and quality of life (items 29 and 30) containing the following questions: 'How would you rate your overall health during the past week?' and 'How would you rate your overall quality of life during the past week?' Answering options ranged from *very poor* (1) to *excellent* (7) on a seven-point scale.

Second, it included the Linear Analog Self-Assessment scale (LASA; Locke et al., 2007). A rating of the overall quality of life was made along a line with on the left the label *lowest possible quality* and on the right the label *highest possible quality*.

Third, Cantril's Ladder (Cantril, 1965) was included. Respondents could rate their current quality of life on a ladder ranging from 0 to 10, where 0 resembles *worst imaginable quality of life* and 10 resembles *best imaginable quality of life*.

Fourth, the last question was: 'Suppose you compare yourself with others of the same age and sex with a similar type of cancer, how do you think you are doing currently compared to those people?' Possible answers ranged from *much worse* (1) to *much better* (7) on a seven-point scale (Brakel et al., 2012).

To compute the composite quality of life score, the scores of the LASA and Cantril's Ladder were converted into scales of 1–7, and the scores on all five items were averaged (α_{pre} = .85, M = 4.90; SD = .85; α_{post} = .87, M = 4.95; SD = 1.07).

Life satisfaction was the second outcome variable. It was assessed with the Life Satisfaction Scale (Brakel & Dijkstra, 2008). It concerned a six-item questionnaire that measures satisfaction with life in general, with one's psychological state and with one's social contacts (Brakel et al., 2012; Brakel, Dijkstra, Buunk, et al., 2012), for example, 'During the past week, how satisfied were you in general?' and 'During the past week, how ideal was your life in general?' Answering options ranged from *not at all* (1) to *very much* (7), α_{pre} > .88, M = 5.34; SD = .99; α_{post} > .89, M = 5.38; SD = 1.07.

Moderators. *Perceived life threat* was measured at pre-test using the following question: 'To what extent do you perceive cancer as life-threatening?' Answering options ranged from *not at all* (1) to *very* (5), M = 3.54, SD = 1.12.

Health expectations were measured at pre-test using two questions. The first question was: 'What are your health expectations from your point of view?' The second question was: 'What

are your health expectations according to your doctor?' The following answers were possible: *It will rapidly get worse* (1), *It will slowly get worse* (2), *It will stay the same* (3), *It will slowly get better* (4), *to It will rapidly get better* (5), $\alpha_{pre} = .95$, $M = 4.00$, $SD = .85$.

Measurements for information adaptation. The social comparison information that patients received in the intervention condition was adapted to the self-reported health status and social comparison sensitivity of patients. *Self-reported health status* was measured at pre-test with 28 items of the EORTC QOL-C30, which measures subjective health status (Leplège & Hunt, 1997). Besides five single-item symptom queries, the items were divided over five functional scales (physical, role, cognitive, emotional and social) and three symptom scales (fatigue, pain, and nausea and vomiting). For example: 'Were you in pain during the past week?' Answering options ranged from *not at all* (1) to *very much* (7) on a seven-point scale, $\alpha = .92$.

Social comparison sensitivity was measured at pre-test using the Identification-Contrast-scale (Dibb & Yardley, 2006; Van der Zee, Buunk, Sanderman, Botke, & van den Bergh, 2000) as advocated by Brakel, Dijkstra, Buunk, et al. (2012). In this questionnaire, participants self-report the extent to which they usually experience positive or negative emotions in response to different social comparison targets. Higher scores indicate an intensified affective responsiveness, indicating a stronger sensitivity to social comparison information. The questionnaire consists of 12 items with answering options ranging from *strongly disagree* (1) to strongly *agree* (5) on a five-point scale. For example: 'When I think about others who are better off, I feel frustrated about my own situation,' $\alpha_{pre} = .73$.

Manipulation check. In order to check whether the treatment was received as intended, participants were asked whether or not they had listened to the audio file. In addition, these answers were validated using an automated measurement tool: a computer program kept track of the time between the moment the participant pushed the start button and the pause or stop button. Overall, the data from the computer measurement were consistent with the self-reported data. The post-test questionnaire consisted of the quality of life and life satisfaction measures that were also applied at pre-test.

Post-test questionnaire. The post-test questionnaire consisted of the quality of life and life satisfaction measures that were also applied at pre-test.

Drop Out and Sample Characteristics

Two hundred and eighty-three patients started answering the first questionnaire (see Figure 1 for the flow chart). Due to a technical problem, the data of 13 patients could not be retrieved properly. Of the remaining 270 patients, 50 did not fill in essential parts of the questionnaire, leaving 220 respondents with complete pre-test data (81%). Not all of these participants met the inclusion criteria: for 26 participants, the hospital treatment had been completed more

than 12 months ago and 49 participants were still under medical treatment in a hospital. These respondents were removed from the data-set. In the experimental condition, nine participants indicated that they had not listened to the interview and five participants received the wrong script. These respondents were also removed from the data-set.

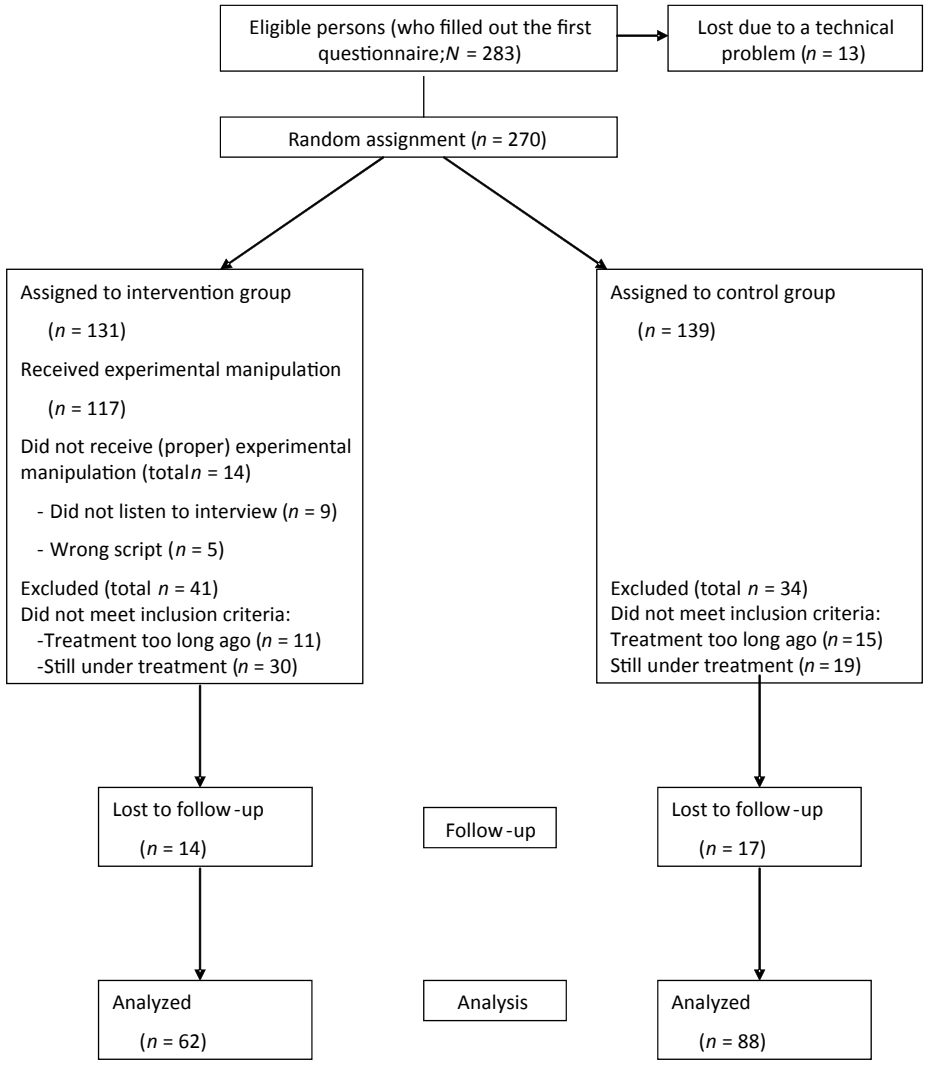

Figure 1. Flow of participants through each stage of the experiment.

The distribution of the remaining 150 patients over the conditions was as follows: experimental condition $n = 62$ and control condition $n = 88$. The sample consisted mostly of women (81%). Their ages varied from 19 to 82 years ($M_{age} = 51.85$, $SD = 11.41$). Most participants had college/university training (51%), were married or had a partner (86%) and were not religious (73%). Those who were religious were all Christian. The patients had been treated for a wide variety of cancer types. The most prevalent form of cancer was breast cancer ($n = 79$). Most patients had undergone surgery ($n = 129$) and more than half of all patients had received chemotherapy and/or radiation therapy (see Table 2 for demographic and cancer-related characteristics). The dropout rate from the pre-test to the two-month follow-up test was 10.1% for the experimental condition and 12.2% for the control condition.

Table 2. Demographic Composition of the Sample.

		Full sample		*Intervention*		*Control*	
		N	*%*	*N*	*%*	*N*	*%*
Sex:	Male	29	19.3	11	17.7	18	20.5
	Female	121	80.7	51	82.3	70	79.5
Age Range:	18-50	70	46.7	26	41.9	44	50.0
	>51	80	53.3	36	58.1	44	50.0
Marital Status:	Married	105	70.0	40	64.5	65	73.9
	Living together	15	10.0	9	14.5	6	6.8
	Partner, not living together	9	6.0	4	6.5	5	5.7
	Single	13	8.7	7	11.3	6	6.8
	Sep/Div/Wid	8	5.3	2	3.2	6	6.8
Education:	Vocational training	13	8.7	6	9.7	7	8.0
	Advanced vocational training	58	38.7	26	41.9	32	36.4
	College/university training	77	51.3	29	46.8	48	54.5
	Not known	2	1.3	1	1.6	1	1.1
Most prevalent cancer types:	Breast Cancer	79	52.7	33	53.2	46	52.3
	Non-Hodgkin	5	3.3	3	4.8	2	2.3
	Colon Cancer	13	8.7	3	4.8	10	11.4
	Hodgkin	3	2.0	1	1.6	2	2.3
	Lung Cancer	3	2.0	0	0.0	3	3.4
Type of treatment:	Operation	129	86.1	54	87.1	75	85.2
	Hormone therapy	43	28.9	19	30.6	24	27.3
	Chemo therapy	100	65.4	36	58.1	64	72.7
	Radiation therapy	87	57.8	35	56.5	52	59.1
	Blood transfusion	10	6.4	3	4.8	7	8.0
Months since treatment		3		3		3	

Note. Sep/div/wid = separated, divorced and/or widowed

Results

Randomization Check and Attrition Analyses

The experimental group and the control group did not differ significantly on demographic and other variables assessed prior listening to the audio file, which suggests a successful randomisation. Non-responders to the second questionnaire ($n = 48$) were equally divided between the experimental and the control group. Non-responders were significantly more often religious, younger, more often single, had a worse self-reported health status, a lower quality of life, worked fewer hours, got blood transfusions more often, had changed more in appearance due to cancer and found confrontation with other patients who seemed to have fewer difficulties with cancer threatening. The patients who were removed from the data-set because they did not listen to the audio file (according to our log data) did not differ significantly on any of the measures that were assessed prior to the manipulations from patients who did listen.

Preparatory Statistical Analyses

Perceived life threat and health expectations were significantly correlated ($r = -.23$) at pre-test. Therefore, the two-way interactions of both potential moderators with condition were tested in one saturated model, to check and control for confounding (Yzerbyt, Muller, & Judd, 2004).

Main Analyses

Quality of life as dependent variable. The hypothesis was that perceived life threat and health expectations would moderate the effects of the social comparison intervention package on quality of life. An ANCOVA was computed with the two interactions in a saturated model and post-test quality of life as the dependent variable (pre-test quality of life was entered as covariate). There were no main effects of condition, $F(1, 141) = 1.79$, $p = .18$, $\eta_p^2 = .01$, health expectations, $F(1, 141) = 2.12$, $p = .15$, $\eta_p^2 = .02$, or perceived life threat, $F(1, 141) = 1.76$, $p = .19$, $\eta_p^2 = .01$. The two-way interaction of condition with perceived life threat was also not significant, $F(1, 141) = 1.23$, $p = .27$, $\eta_p^2 = .01$. The two-way interaction of condition with health expectations was significant, $F(1, 141) = 7.37$, $p = .007$, $\eta_p^2 = .05$. Thus, only health expectations had a unique moderating effect on quality of life.[1]

In subsequent analyses, the meaning of this significant two-way interaction was investigated using ANCOVA's. To study the effects of condition when health expectations were low and when they were high, a low group and a high group were modelled using the complete data-

set by adding 1 standard deviation and subtracting 1 standard deviation, respectively, from the mean-centred scores on health expectations (Cohen, Cohen, West, & Aiken, 2003). Figure 2(a) shows the mean scores on quality of life in the experimental and control condition for patients with positive and negative health expectations. Among patients with positive health expectations, quality of life was significantly lower in the experimental condition ($M = .91$) compared to the control condition ($M = 1.32$), $F(1, 142) = 6.05$, $p = .015$, $\eta_p^2 = .04$. In contrast, patients with negative health expectations showed a significantly higher quality of life in the experimental condition ($M = 1.05$) than in the control condition ($M = .71$), $F(1, 142) = 3.97$, $p = .048$, $\eta_p^2 = .03$.

To rule out the possibility that the effect of the moderator was caused by an underlying factor – the type of cancer – an additional analysis was run. The respondents were recoded into having had breast cancer ($n = 79$) or having had another type of cancer ($n = 71$). Next, the Condition × Type of Cancer interaction was now added to the above-tested original model including both interactions. The two-way interaction of condition with cancer type was not significant ($p = .83$), while the Condition × Health Expectations interaction was still significant. These results suggest no confounding by type of cancer.

Life satisfaction as dependent variable. The hypothesis regarding life satisfaction was that perceived life threat and health expectations would moderate the effects of the social comparison intervention package on life satisfaction. Using the same saturated model as above including both interactions, again, there were no main effects of condition, $F(1, 143) = .68$, $p = .41$, $\eta_p^2 = .005$, health expectations, $F(1, 143) = .68$, $p = .41$, $\eta_p^2 = .005$, or perceived life threat, $F(1, 143) = .59$, $p = .45$, $= .004$. The two-way interaction of condition with health expectations was not significant, $F(1, 143) = 1.17$, $p = .28$, $\eta_p^2 = .008$, while the two-way interaction of condition with perceived life threat was significant, $F(1, 143) = 12.10$, $p = .001$, $\eta_p^2 = .08$. Thus, perceived life threat had a unique moderating effect on life satisfaction (see Note 1).

To investigate the meaning of this significant two-way interaction, the same procedure was followed as above: two groups were modelled, one scoring high and one scoring low on perceived life threat. Figure 2(b) shows the mean scores on life satisfaction for the experimental and control condition for patients with either a high or a low perceived life threat. Among patients with a high perceived life threat, life satisfaction was significantly higher in the experimental condition ($M = 3.90$) than in the control condition ($M = 3.08$), $F(1, 143) = 14.81$, $p < .001$, $\eta_p^2 = .09$. For patients, however, with a low perceived life threat, life satisfaction was significantly lower in the experimental condition ($M = 3.12$) compared to the control condition, ($M = 3.55$), $F(1, 143) = 4.49$, $p = .036$, $\eta_p^2 = .03$.

Again, confounding of these results by type of cancer was tested by including the Condition × Type of Cancer interaction in the model. The two-way interaction of condition with cancer type was not significant ($p = .96$), while the Condition × Perceived Life Threat interaction was still significant. These results suggest no confounding by type of cancer.

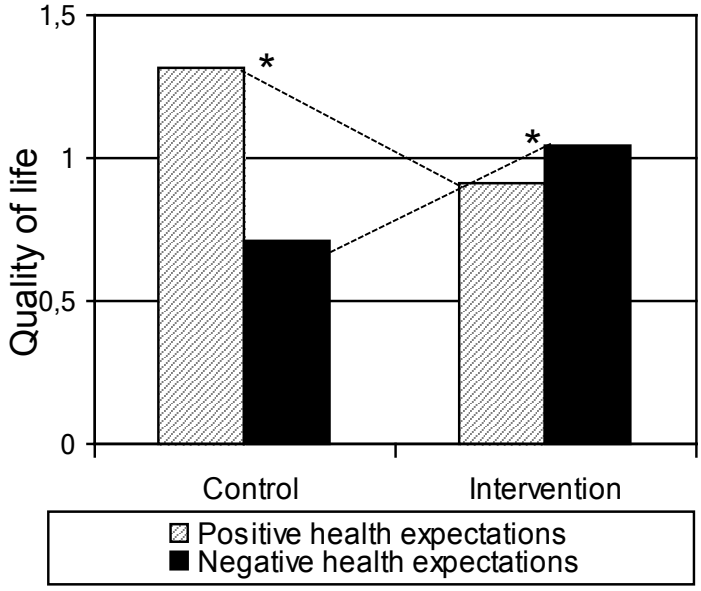

Figure 2a. Quality of life for patients with positive or negative health expectations in the control and intervention condition.

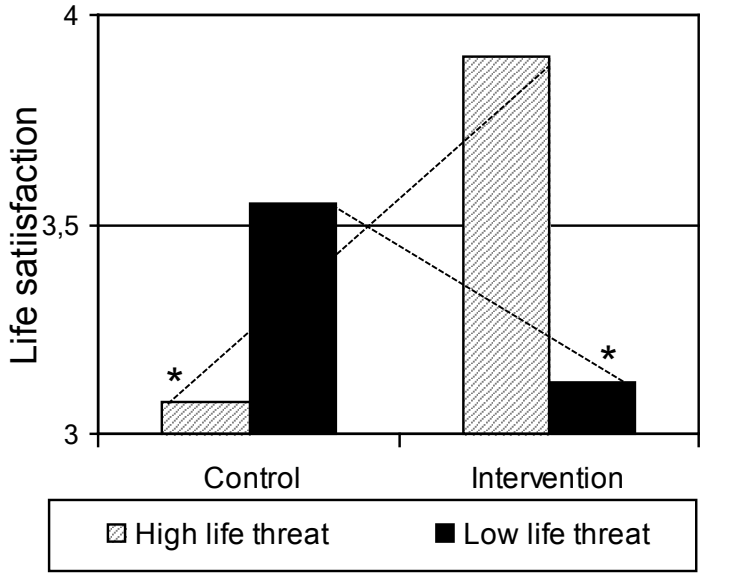

Figure 2b. Life satisfaction for patients with high or low perceived life threat in the control and intervention condition.

Intention-to-treat analysis

To conduct an intention-to-treat analysis, missing values of non-responders on the post-test quality of life scale were replaced with their scores on the pre-test. Using the same ANCOVA model as above, this analysis revealed that the Condition × Health Expectations interaction with quality of life as a dependent variable and pre-test quality of life as covariate was still significant, $F(1, 191) = 6.146$, $p = .014$, $\eta_p^2 = .03$. Similarly, the intention-to-treat analysis with life satisfaction as a dependent variable, using the same ANCOVA model as above, showed that the Condition × Perceived Life Threat interaction was still significant, $F(1, 191) = 10.74$, $p = .001$, $\eta_p^2 = .05$.

A Match-Mismatch Test for the Level of Life Threat on Life Satisfaction

The interaction effect of condition with perceived life threat shows that for patients with a specific level of life threat the social comparison information was either beneficial or detrimental for their level of life satisfaction compared to the control condition. In other words, for one level of life threat the social comparison information 'matched' individuals while for another level of life threat the social comparison information 'mismatched' individuals. To test the size of the difference between matches and mismatches of the experimental and the control condition, we conducted a match-mismatch test. For patients with high perceived life threat the experimental condition was considered a match whereas the control condition was considered a mismatch. For patients with low perceived life threat the experimental condition was considered a mismatch whereas the control condition was considered a match. In this way a new dichotomous variable was computed and used in an ANCOVA with life satisfaction as dependent variable and pre-test life satisfaction as covariate. This test was significant, $F(1, 147) = 11.83$, $p = .001$, $\eta_p^2 = .07$ (mismatch $M = 5.17$, $SD = 1.08$, $n = 76$; match $M = 5.61$, $SD = 1.02$, $n = 74$). Cohen's d effect size was 0.43 indicating an almost medium effect.

A Match-Mismatch Test for Level of Health Expectations on Quality of Life

We conducted also a match–mismatch test for the level of health expectations with quality of life as outcome variable. For patients with positive health expectations, the experimental condition was considered a mismatch and the control condition was considered a match. For patients with negative health expectations, the experimental condition was considered a match and the control condition was considered a mismatch. This new computed dichotomous variable was used in an ANCOVA with quality of life as dependent variable and pre-test quality

of life as covariate. This test was significant, $F(1, 145) = 11.36$, $p = .001$, $\eta_p^2 = .07$. (mismatch $M = 4.68$, $SD = 1.17$, $n = 75$; match $M = 5.23$, $SD = .94$, $n = 73$). Cohen's d effect size was .53 indicating a medium effect.

Discussion

The goal of this study was to examine whether patients with individual differences in perceived life threat and health expectations reacted differently to the social comparison intervention package. This information comprised fellow former cancer patients' experiences during their recovery phase and featured either one interview with two fellow patients or an interview with an expert in the oncological field. The social comparison information was adjusted to type of cancer, gender and age. Age was, however, not mentioned when the information came from an expert. In addition, the information was adapted to individual differences relevant to the processing of social comparison information based on earlier findings (self-reported health status and sensitivity to social comparison information [Brakel et al., 2012; Brakel, Dijkstra, Buunk, et al., 2012]).

The hypothesis was confirmed: only patients with a negative perspective on their present or their future health did benefit from the social comparison information; it increased their life satisfaction and quality of life, respectively. Thus, only in patients with a high perceived life threat and negative health expectations, it seemed there was room for improvement. We assume that the social comparison information was congruent with these patients' need to cope with their situation: the information may be used to construct a more positive perspective on their present and future.

As expected, patients with a low life threat and positive health expectations did not benefit from the social comparison information and even deteriorated after being exposed to the social comparison information. The fact that social comparison information had undesirable negative effects on patients with a positive perspective on the present or their future health might indicate that these patients' perspectives were positive, but unstable. The social comparison information may have disturbed the psychological equilibrium that these patients had formed for themselves. The information was incongruent with their goal of keeping their delicate positive mental balance. It is possible that these patients were confronted with the idea that they were not doing as well as they thought they were. Such a downward assimilation may have messed up the status quo they had managed for themselves. One blunt option to protect these patients from such negative effects is to advise them to avoid social comparison information, for example, by not joining groups with fellow patients and avoiding close interactions with fellow patients. Another suggestion is to expose these patients in a group or with an audio file to social comparison information from fellow patients who are equally (maybe unrealistically) optimistic. This might consolidate their optimistic view and leave their status quo.

Another possibility is to teach these patients specifically to focus on the differences between themselves and fellow patients. They might be instructed to contrast themselves with others (e.g. 'all people are unique'), thereby, preventing downward assimilation.

The results furthermore showed that health expectations had a unique moderating effect on quality of life, yet no significant effect on life satisfaction. In addition, the level of perceived life threat had a unique moderating effect on life satisfaction but no significant effect on quality of life. Furthermore, perceived life threat and life satisfaction were significantly but weakly correlated at pre-test ($r = -.23$). These results suggest that although there is a certain commonality between both perspectives, the psychological states they represent are different, and uniquely related to different, albeit similar, outcomes (quality of life and life satisfaction). Additional research is needed to further disentangle both outcome measures and their relationships with individual differences in distinguishable health perspectives.

The type of cancer did not seem to confound the moderation effects. That is, it might have been the case that the effects of the social comparison intervention in patients with a positive future health expectation were related to a type of cancer with a relatively positive treatment outcome (e.g. breast cancer). Our analyses suggest, however, that the effects are independent of type of cancer (breast cancer vs. other types of cancer). Although this fits our psychological reasoning, we cannot rule out that a more specific parameter of illness severity – like stage of the disease or cancer recurrence – would have confounded the effects. Future research should address this topic.

Discussion of Clinical Implications

Our findings reveal that social comparison information had negative effects on some patients. Considering only the main effects from this intervention study, it appears reasonable to assume that 'it never hurts to listen to information from others' as the main effects of condition on quality of life and life satisfaction were not significant. The intervention was, however, not inert: though it had positive effects in some patients, it had negative effects in others. The match–mismatch test revealed how serious the effects of offering mismatched information to individuals can be: the effect size was medium for quality of life and almost medium for life satisfaction. It is plausible that in health care practice and on the Internet, social comparison information will also have negative effects on patients with certain individual characteristics. Patients with a low life threat and positive health expectations, for instance, may not benefit from contact with fellow patients in a support group; the social comparison information might disturb their psychological equilibrium. Although the present data are preliminary, the findings of this study draw attention to the possible side effects of the social comparison intervention but possibly also of psychosocial interventions for cancer patients in general. In addition, our results highlight the importance of considering individual differences when evaluating such interventions.

Limitations and Generalizability

This study has some relevant limitations. Attrition analyses showed that post-test non-responders differed from responders in relevant ways: at pre-test, non-responders had a worse health status and a lower quality of life. Subsequent analyses showed that these vulnerable patients felt more threatened by a confrontation with fellow patients in comparison with the responders. It is possible that they stopped listening to the audio file to avoid the social comparisons that may have made them feel bad. The non-responders were, however, equally distributed over the conditions. Therefore, the effects of the conditions can still be compared. Generalizing the current findings to the population of former cancer patients as a whole should be done with caution. The present results might be generalized to patients who do not belong to the most vulnerable group and who do spontaneously visit websites about cancer-related aspects or seek help at an oncological health care centre. The present results might be generalized to patients who dare to be confronted with fellow patients and do not avoid the topic of cancer.

Thus, the current sample is probably not representative of the whole population of individuals recovering from cancer. There were, for example, far more women than men in this study. Still, when the analyses were controlled for various variables – such as gender – the results were essentially the same. This means that although the sample lacks representativeness, the moderating effect of life threat and health expectations can probably still be generalized to patients who spontaneously visit cancer-related websites or support groups.

Another limitation concerns the measurement of both moderating health perspectives: the short length of the brief measurement scales for health expectations (two items) and perceived life threat (one item) could be problematic. However, the fact that they significantly moderated the effects of the information suggests that both scales were actual parameters of relevant psychological processes.

Another limitation is that we tested a limited set of covariates and moderators. In the current study, for example, patients were included regardless of whether their particular cancer was initial or reoccurring. It is conceivable that this may influence patients' perspectives on their present or future. Therefore, in future studies, the cancer history of patients could be taken into account as possible covariate or moderator. Another variable to be assessed in future studies is the frequency of listening to the audio file: repeated exposure to the information may exert stronger effects. A final covariate or moderator may be the gender of the expert in the interview; in this study, expert gender was not matched to patient gender. A female expert was chosen because this was expected to appear naturalistic as 75% of the Dutch psycho-oncologists are female. This issue may be further addressed in future studies.

The present study was not designed to test why a social comparison intervention can be effective. In the present tailored social comparison intervention package, individuals received different types of information that probably activated different social comparison mechanisms (e.g. upward assimilation or downward contrast). These processes were not assessed. However, a moderation effect on quality of life and life satisfaction with this intervention package was

expected, and found. This means that the content of the intervention was not inert, although no certainty exists about the concerning mechanisms. In further research, it could be tested whether the suggested working mechanisms are indeed responsible for the effects. This is not easily tested in large field experiments with cancer patients and, therefore, more controlled lab studies are needed.

Conclusion

An intervention in which former cancer patients are confronted with tailored social comparison information influenced their quality of life and life satisfaction, assessed two months later. Moderator analyses revealed that quality of life and life satisfaction improved for some patients but decreased for others depending on the patients' level of perceived life threat and health expectations. Therefore, psychosocial interventions in which patients are confronted with fellow sufferers might backfire for certain patients, although this may remain undetected when no moderator analyses are conducted. These results stress the need for smarter interventions that take into account more individual differences.

Footnote

[1]Controlling for the effects of health status, social comparison sensitivity, gender, age, education level, and personal situation, only resulted in minor changes in *p*-values. The significant two-way interaction remained

Chapter 5

General Discussion and Integration

General Discussion and Integration

Effects of Different Aspects and Conditions of the Social Comparison Intervention

The central question in the present work was how the subjective quality of life in cancer patients who had finished their treatment in the hospital, could be improved by offering them social comparison information from or about fellow patients. Social comparison is a broad concept that is shaped into a specific operationalization in an intervention. It may be that the effects of any social comparison intervention are caused by the specific operationalization used. In the present studies the social comparison information had its specific characteristics and was varied along some central dimensions.

Type of social comparison information. In each of the three studies, three different types of social comparison information were presented: on emotions-only, on coping-only, and a combination of both. In everyday life most social comparisons provide information on emotions that individuals express, as well as information on coping, i.e., descriptions of how individuals actively try to deal with their situation (Silver, Wortman, & Crofton, 1990). Thus, the combination condition may be viewed as the "natural" way of providing social comparison information. In the present studies this natural situation was dismantled into emotions-only and coping-only social comparison information, to study the differences between the three resulting types of social comparison information. The first finding was that, indeed, the types differed in their effects on quality of life, but that these effects depended on *social comparison sensitivity* (SCS), i.e., the tendency to experience emotions as a consequence of social comparison, and on the perceived physical status. That is, for patients with a relatively good health status, those who were more sensitive to social comparison information reported a higher quality of life, whereas those who were less sensitive experienced a lower quality of life. For patients with a relatively poor health status however, this pattern was reversed. Those who were more sensitive to social comparison information reported a lower quality of life, whereas those who were less sensitive reported a higher quality of life. This pattern was most pronounced in the type of social comparison information that combined emotions and coping. To conclude, the effects of the three types of social comparison information differed, thereby corroborating earlier findings on different types of social comparison information (Buunk et al., 2009).

These differences in type of information may be explained in the following ways. Listening to a patient who only expresses negative emotions and concerns, and who seems overwhelmed by the problems can make the listener aware of one's own vulnerability ("the same could happen to me") and could arouse negative feelings such as feelings of helplessness and tension (Silver, et al., 1990). Consequences may be discomfort in the listener and avoidance or rejection of the patients who express themselves in this emotional way. On the other hand, listening to an individual who only expresses how he or she deals with the situation may not be

informative to the listener. For example, the statement on coping "I called friends to distract myself from thinking about the cancer" contains little new information on ways of coping. Next to this, when this is the only type of information that was provided by a patient, it seems obvious that the patient does "not tell the whole story". That is, a cancer patient is expected to experience negative emotions of any kind, so when a patient does not show any negative emotions it seems that he or she is holding back information. This may undermine the relationship (Silver et al., 1990). In sum, information on negative emotions-only may become too threatening to the listener and may activate defensive self-regulation that lowers its affect, while coping-only information may lack relevance, it may be inert.

Analogue to the use of a medicine, the compound-only (emotions-only information) may harm the stomach, but when the compound is packaged with a coating (coping information), the medicine's negative side effects may be avoided. However, the coating-only has no curative power; it is inert. This notion is further confirmed by findings from the field of health persuasion that only inducing a higher threat (emotions-only information) in people does not make them change their behavior; it only leads to more change when it is accompanied by efficacy information on how to change the behavior (coping-only information; Peters, Ruiter, & Kok, 2012).

Idiosyncratic versus aggregated social comparison information. In Study 1, the social comparison information was presented in an interview with two fellow cancer survivors telling about their own experiences. Thus, two concrete individuals presenting their idiosyncratic information were the social comparison targets, the recipients only heard their voices. In contrast, in Study 2 only one female expert in the socio-oncology field was interviewed about her patients' experiences. She presented aggregated information about her patients; how they "normally" feel, what they have "in common", how they deal with cancer-related topics "on average" or "in general".

Aggregated information could be perceived as a prescribing norm. It could be perceived as a consensus of a group of others which can be translated into how one ought to behave or what is "normal". Patients' feelings of uncertainty may be reduced when they learn they behave according to this prescribing norm. This is in contrast to the idiosyncratic information which seems a "unique individual narrative" that does not imply a social norm but rather presents one possible way to experience and behave as a former patient.

Despite these essential differences between idiosyncratic and aggregated social comparison information (Buckingham & Alicke, 2002), the pattern of effects of the social comparison information on the quality of life in Studies 1 and 2 were similar. It may be that the differences between aggregated and idiosyncratic information became smaller in the presently used intervention format in which no actual contact was made with the social comparison targets, as was the case in earlier tests of this difference (Buckingham & Alicke, 2002). Thus, both types of social comparison information may have become somewhat more "distant" from the recipient, thereby reducing the differences.

In addition, within Study 2, the three aggregated experimental conditions were compared to one idiosyncratic condition that was confounded by the tailoring. The information was tailored for those patients in such a way that they received what was best for them according to

the findings of Study 1. In the aggregated conditions the information was randomly assigned. Therefore no unconfounded comparison can be made between the idiosyncratic and aggregated social comparison information conditions. Clearly more empirical data are needed to test whether it is better to use aggregate or idiosyncratic social comparison information, and how this depends on individual differences.

Tailoring. In the design of the social comparison information it was assumed that a basic similarity between the recipient and the target is necessary. The social comparison information should therefore be tailored to some extent, at least creating global similarity. Social comparison information can be tailored to individual circumstances and characteristics by adaptation or personalization using computer technology (Dijkstra, 2008). Adaptation means that the content and/or the type of information is adjusted to match the individual's physical state or individual psychological characteristics, like health status and social comparison sensitivity. Personalization refers to incorporating recognizable information in the message that suggests that the content message fits the recipient.

In all three present studies, the comparison others in the social comparison message were cancer patients like the recipient, with the same type of cancer, about the same age, and with the same gender. In Study 2 in the control condition, and in Study 3, the type of social comparison information (emotions-only, coping-only or a combination of emotions and coping) was also adapted to the health status and social comparison sensitivity of the recipients. Furthermore, in Studies 2 and 3 the recipients could choose four out of seven content topics that would next be presented in the social comparison information. Thus, with the use of computer technology the audio files were tailored to a substantial degree, although more detailed tailoring is certainly possible (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008). It is, however, unclear what the effect might be of more complex individual tailoring, taking into account additional individual characteristics. Qualitative information from former patients in incidental telephone and email contacts during the present studies, and published qualitative data (Overberg, Alpay, Verhoef, & Zwetsloot-Schonk, 2007) provide a wealth of ideas on where to additionally tailor the information to, for example, on the sexual aspects of having cancer, on specific symptoms (such as fatigue), or on the need for practical information.

Because the present studies did not include a non-tailored condition, it also remains unknown what the effects of different types of non-tailored social comparison information would have been. One basic future study should systematically vary the extent of the tailoring of social comparison information.

In sum, the social comparison information in the three studies varied in three aspects. The first was the type of social comparison information (emotions-only, coping-only, or both) which might affect whether the information is perceived as threatening, inert or informative. The second was the source of the social comparison information (fellow patient or psycho-oncology specialist) which might affect whether the information is perceived as a prescribing norm or a unique story. The third aspect was the tailoring of the social comparison information, which might affect the perceived similarity of the social comparison target(s).

Other Findings and Issues

Construction of quality of life. As argued in the introduction of this thesis, social comparison information is expected to influence the extent to which patients are able to construe a satisfactory perspective on their illness. It can be concluded that in some patients this worked: Their quality of life improved, supposedly because they were provided with information that strengthened a positive perspective. However, in others it did not work: The information had no effect while in others it seemed even to have led to a more negative perspective on their situation. It is not clear whether this was caused by the social comparison information that actively provided a new but negative perspective, or that an existing positive perspective was disturbed. The latter effect was suggested by the data in Study 3. Future studies should focus more on the processes involved in bringing about positive but also negative changes in quality of life.

Social comparison orientation versus social comparison sensitivity. In Studies 1 and 2 significant correlations were found between the scales assessing social comparison orientation (SCO) and the scale assessing social comparison sensitivity (SCS; respectively $r = .31$ and $r = .42$). SCO assesses the extent and frequency of making social comparisons and is related to the evaluative, affective, and behavioral reactions of participants towards social comparison information (Gibbons & Buunk, 1999). Indeed SCO, like SCS, moderates effects of social comparison information (e.g. Bosch, Buunk, Siero, & Park, 2010; Buunk, 2005; 2006; Buunk et al., 2012; Buunk & Brenninkmeijer, 2001; Buunk & Dijkstra, 2011; Buunk, Oldersma, & De Dreu, 2001; Buunk, Van der Zee, & Van Yperen, 2001; Buunk, Ybema, Gibbons, & Ipenburg, 2001; Buunk, Zurriaga, Gonzalez-Roma, & Subirats, 2003; Gibbons, Lane, Gerrard, Pomery, & Lautrup, 2002; Michinov & Michinov, 2001; 2011; Van der Zee, Oldersma, Buunk, & Bos, 1998). However, in Study 1 the three-way interaction between condition, SCS and health status remained significant when the saturated model of SCO was entered in the analysis, whereas the interaction with SCO, which was significant in the original three-way interaction, was no longer significant. Although not reported in this thesis, the data from Study 2 showed a similar effect. Thus, when the directly reported emotional reactions towards social comparison information (as measured with the SCS) were included in the model predicting quality of life, the extent and frequency of making social comparisons (as measured by the SCO) had no effect anymore. This suggests that, with respect to the quality of life of cancer patients, the emotional reactions towards social comparison information may be more important than the tendency to compare oneself. The effects of SCS as operationalized as the inclination to react overall stronger with positive as well as negative emotions towards social comparison information were consistent in Studies 1 and 2. However, in Study 2 the inclination to react with positive emotions (SCS-positive interpretation; Van der Zee, Buunk, Sanderman, Botke, & Van der Bergh, 2000) showed a more pronounced pattern of the same interaction.

No main effects. In Studies 1, 2, and 3 no main effects of the social comparison conditions were found. Considering only main effects could thus lead to the conclusion that listening to social comparison information never hurts the listener. However, our findings revealed that when individual differences are taken into account social comparison information can have detrimental

effects in some people. Taylor et al. (2007) mentioned on theoretical grounds that an individual difference in the level of distress may lead to no beneficial effect, or even a negative effect on quality of life in a group-based psychosocial program: On the basis of the social comparison perspective, non-distressed patients appear to make lateral or downward comparisons which could pull them down when they have actual contact with other cancer patients. In Studies 1 and 2 the individual differences in self-reported health status and SCS accounted for the beneficial and detrimental effects. In Study 3 individual differences in illness beliefs accounted for such negative effects.

The overall match-mismatch tests revealed how serious the effects of mismatched information can be. In this test the patients for whom the different conditions had a positive effect are recoded as having received "matched" information. Patients for whom the different conditions had a negative effect are recoded as having received "mismatched" information. This math-mismatch comparison reveals the overall relevance (effect size) of matching or mismatching conditions. In Study 1, the size of the effect was almost large. In Study 2 – although not reported – this effect size was medium, as it was in Study 3. These effect sizes indicate that the effects of mismatching are substantial.

The present research suggests that although in health care practice and on the Internet, testimonials of (former) patients seem presented uncritically and as if they cannot do any harm, it is plausible that this powerful information may have negative effects in subgroups of recipients. Even more so, the findings of the present studies draw our attention to possible side effects of psycho-oncological but also to psychosocial interventions in general. While in medical treatments side effects are investigated thoroughly, in psychosocial treatments the possibility of side effects is mostly unknown and is not considered a problem. Therefore, studies on psychosocial interventions should include measures of individual differences that make it possible to determine how different types of information are processed and received by subgroups of recipients.

Effect over time. In Studies 1 and 2 the first post-test conducted was about three weeks after the cancer patients were exposed to the social comparison information. The patterns of outcomes that were found after two months and were reported in this thesis were already present at the three week follow-ups (not reported), although the patterns were less pronounced. This suggests that the intervention instigated a process that took time to develop and that was detectable in its complex interaction form after two months, with the specific number of participants. It is unclear whether the effect was at its highest or on its return or whether the effects may even have grown stronger over time. Future research is needed to detect the development of effects, and the longer term effects.

Further exploring the Moderations

Social comparison sensitivity and perceived health status. In Studies 1 and 2, the individual difference in sensitivity to social comparison information (SCS-total and SCS-positive interpretation, respectively) was an important factor in the way exposure to social comparison information affected quality of life. This effect however, depended on people's self-reported

health status. Patients with a high SCS developed a higher quality of life when they perceived their health status as good. In patients with a low SCS but a poor health status, quality of life has also improved two months after the intervention. However, patients with high SCS and a poor health status, and patients with a low SCS that was accompanied with a good health status had a lower quality of life two months later. To understand this interaction, it is important to have a good understanding of how both moderators, self-reported health status and social comparison sensitivity (SCS), were assessed.

Self-reported health status was assessed with 28 items of the EORTC QOL-C30. These items assess the extent of specific physical symptoms or experiences such as pain and fatigue, and functioning, such as role and emotional functioning, during the last week. Thus, the scale does not assess patients' global evaluation of their present status; the two global items from the EORTC QOL-C30 – ratings of overall health and quality of life – were removed and incorporated in our measure of subjective quality of life. The remaining 28 items give patients the opportunity to score "how they are doing"; not so much on the basis of how they feel or evaluate their life in general but on the basis of a range of specific symptoms and functions (Leplège & Hunt, 1997).

SCS was assessed with the items of the Identification-Contrast scale (Van der Zee, et al., 2000). These items assess the emotions (6 positive and 6 negative) people experience when they compare themselves to others. In the original use of the Identification-Contrast scale the 12 items are thought to assess four social comparison processes: upward and downward identification and contrast (Buunk & Ybema, 1997). The items all consist of three related parts, for example: "If I think about others" (referring to social comparison in general) "who have more difficulties than I have" (referring to social comparison direction) , "I feel happy that I am doing so well myself" (referring to the resulting emotion). Thus, in this use of the scale the focus on the experienced emotion 'happiness' in combination with the downward comparison, is interpreted as an indication of downward contrasting. However, in the SCS-use of the items the focus is on the emotion in combination with the general social comparison process, excluding interpretation of the direction. This leaves different formulations of the items (upward and downward comparisons) that all assess the strength of the emotions in response to social comparisons in general (independent of direction). These emotional responses were conceptualized in the present studies as an indication of sensitivity towards social comparison information. The higher score cancer survivors had on all items together, the more emotional responses they seem to experience caused by the comparison of the self with upward as well as downward comparison targets. Thus, our interpretations of the item scores did not concern specific underlying social comparison processes but one overarching dimension of sensitivity. Strong negative, as well as strong positive emotional reactions were considered to indicate this sensitivity. Given this interpretation of the scale score, the SCS was used as a baseline measure of individual differences in sensitivity towards social comparison information.

With these ideas of perceived health status and SCS in mind, the interaction found in Studies 1 and 2 can be partially explained by the so-called constraint effect. In this case

the constraint is the natural restriction for patients with a poor health status to make upward comparisons and for patients with a good health status to make downward comparisons. When one's own self-reported health status is very poor; most or all other patients will have a better health status, meaning that downward comparisons are less probable. Likewise, when one's own self-reported health status is good, the patient is largely restricted to making downward comparisons with other patients who are worse off. As Buunk and Gibbons (2007) clarified "if you are at the 90th percentile, than 9 out of 10 of your potential comparison targets are actually downward comparisons" (p. 9).

Patients can engage in assimilation or contrast processes when confronted with social comparison information. On the occurrence of these processes, Mussweiler, Ruter, and Epstude (2004 [a]) conclude: "…assimilation seems more likely if target and standard are close… (e.g., the same birthday)…". What is more important, in the present studies the social comparison information was tailored to each receiving patient; the social comparison target was manipulated to have the same gender, the same type of cancer and about the same age as the patient. Therefore, the social comparison target can be conceptualized as being "close" and therefore it can be expected that the basic process that was triggered by the social comparison information was assimilation. Here the moderation of SCS comes in. For patients with a low SCS, for whom making social comparisons with other patients does not evoke strong emotional responses, indeed, assimilation processes will take place. As a result, downward comparison will evoke feelings of fear to decline and upward comparison feelings of hope to improve. However, in patients with a high SCS, for whom social comparisons usually evoke strong emotional reactions, the default process of assimilation when the social comparison target is close may be overruled by another motive. That is, it can be expected that a testimonial about the topic of cancer activates negative emotions in former cancer patients, particularly strong in those high in SCS. Even apart from the social comparison processes, the topic of cancer might activate strong emotions and memories concerning fear, frustration, and threat. Therefore, patients high in SCS can become motivated to down-regulate these negative emotions. For this purpose they are expected to use contrast processes that overrule the default assimilation processes. Although in general they may also experience strong *positive* emotions towards social comparison information, in the present context of having cancer and being confronted with a "close" target, we expect patients high in SCS to experience strong *negative* emotions that they try to lower by engaging in contrasting information processing. In the case of downward contrast, feelings of being happy and relieved for being better off can arise. Upward contrast can result in feeling threatened and depressive feelings of being worse off can arise. In the original use of the Identification-Contrast scale individual differences in assimilation (or identification) and contrasting might be assessed. However, we expect that these differences are overruled by the direct and immediate effects of the "close" and emotionally laden social comparison information.

The combination of the constraint effect related to perceived health status with patients' social comparison sensitivity can account for the found results: The interaction between perceived health status and SCS determines whether patients will engage in upward or

downward assimilation or upward or downward contrast processes. The results can now be explained as follows (see Table 1): 1) When patients have a good self-reported health status and high SCS, downward comparison and contrast may have occurred: The comparison others are seen as worse off and different from oneself. Consequently, patients will feel better off and experience a higher subjective well-being and higher quality of life (Buunk & Gibbons, 2007); 2) When patients have a good self-reported health status and a low SCS, downward comparison and assimilation may have taken place. The comparison others are seen as worse off but similar to oneself. Consequently, patients will feel the same as others who are not well off. This can be painful (Buunk & Ybema, 1997), and they become pulled down and will now experience a lower subjective quality of life. 3) When patients have a poor self-reported health status and a high SCS, upward comparison and contrast may have taken place. The comparison others are seen as better off but different from oneself. Consequently, patients will feel worse off (e.g., feel fear or disappointment for being worse off) and experience a lower subjective quality of life. 4) When patients have a poor self-reported health status and a low SCS, upward comparison and assimilation may have taken place. The comparison others will be seen as better off but similar to oneself. Consequently, patients will recognize things of themselves and/or feel the same as others who are well off (e.g., feel inspired, relieved or filled with hope of being or becoming like the comparison other who is better off; Buunk & Gibbons, 2007; Buunk & Ybema, 1997), and experience a higher subjective quality of life. Table 1 provides a summary of the main findings of Studies 1 and 2.

Table 1. *Summary of the Main Findings of Studies 1 and 2.*

		Good health status	**Poor health status**
		Downward comparison	**Upward comparison**
High SCS	**Contrast**		
Low SCS	**Identification**		

In the present field experiments the above processes of assimilation and contrast were not directly assessed during or after the exposure to the social comparison information. Therefore, there is no direct evidence of the occurrence of these explanatory processes. Still, the pattern of quality of life in the conditions in Studies 1 and 2 was consistent with the above reasoning on assimilation and contrast.

Illness beliefs as moderators. In Study 3 another set of moderators emerged: Illness beliefs (Hagger & Orbell, 2003). Illness beliefs moderated the effects of a social comparison intervention that took into account the above two moderators, perceived physical status and SCS. For patients who had a negative future health expectation, quality of life was increased two months after the social comparison intervention. Likewise, life satisfaction increased when patients experienced a high level of life threat. Patients' quality of life was decreased two months after the intervention when their future health expectation was positive. Patients' life satisfaction decreased when their experienced life threat was low. Thus, illness beliefs seemed to moderate the effects on a different level, and may be explained by different processes. While the moderators in Studies 1 and 2 were explained on the level of social comparison processes (contrast and assimilation), the illness beliefs were explained to function as indicators of the extent to which individual patients had succeeded to construe a positive perspective of their own situation. That is, patients who had a positive future expectation or who perceived a low present life threat were thought to have construed a positive outlook on their own situation. Study 3 showed that in these patients the social comparison intervention had a detrimental effect. It was argued that the intervention disturbed their self-construed peace of mind. The social comparison information may have confronted them explicitly with the fact that they had been in a dangerous situation (and still might be) and may have undermined their positive outlook. In contrast, in patients who had a negative future expectation or who perceived a high present life threat the social comparison intervention seemed able to support a positive outlook: It increased their quality of life. Our rationale that the illness beliefs are indicators of the extent to which patients have construed their reality in a positive direction might be supported when the illness beliefs would be related to measures of depression and optimism. Future studies may want to address this link.

More individual differences. In a future study, patients could receive social comparison information that takes into account the moderators that were important in Studies 1 and 2 (SCS and perceived health status) and Study 3 (future health perspective and present life threat). Then, even other individual differences could be studied that might moderate the effects of this tailored social comparison information. That is, it is plausible that this intervention, again, would benefit some, but not all people. Potential other individual differences are anxiety and depressive symptoms (distress) which can be measured, for instance, with the Hospital Anxiety and Depression Scale (HADS) or perceived stress which can be measured with the Perceived Stress Scale (PSS). More potential moderators are acceptance of the illness, perceived hope, and the use of specific coping skills. Theoretically, this search for individual differences that moderate the effects of social comparison information will probably go all the way to the level of the individual.

Limitations

The strengths of the present studies are the experimental designs with randomization of participants, the participants being actual former cancer patients, the social comparison information being provided to people in their real-life context (at home), and a follow-up of two months, which is a relevant time period for interventions to increase quality of life. There are, however, some additional aspects that should be taken into account when interpreting the results.

Quality of life measurement. Our 6-item quality of life measure was composed of two existing scales (Cantrils' ladder and LASA overall and physical), a subscale (items 29 and 30 of the EORTC QLQ-C30) and, in Studies 2 and 3, one additional question. To compute the composite quality of life score, all scores were converted to a scale of 1 to 7, and then summed and averaged. This scale was composed to assess changes in subjective quality of life, caused by a change in the psychological construction of reality (as opposed to changes in functions), and to approach the psychological construct of quality of life from more than a single perspective. One limitation of the use of this quality of life scale is that it has not been used before, and, therefore, the exact results cannot be compared directly with those from other studies. In addition, no data on reliability and validity were known. However, the present studies provide some relevant data themselves on these topics [1].

Selection of participants. To increase insight into the selection of participants that eventually provided the two-months follow-up data, it is important to consider the research procedures that were applied. All participants were recruited via ads in local newspapers and on various health and cancer-related websites. In Study 1, participants responded by email or telephone and could choose to fill out the questionnaires on paper and sent it back in a return envelope or to fill them in on the computer and to send it via the Internet. In Studies 2 and 3 participants could only sign in on a webpage to answer the questionnaires electronically. In all studies the participants were told that the aim of the study was to develop new patient information for people who had finished a cancer treatment; patients with incurable cancer could not participate. The above procedures and ways of recruitment may have influenced the selection of participants in various ways. The first selection may have occurred because the ads were published in specific media: local newspapers and on various health and cancer-related websites. Thus, patients who do not expose themselves to these media were not reached. A better cross-section of the cancer population would probably have been obtained when also other channels like radio and television would have been used. Furthermore, in Studies 2 and 3 there was an additional selection as the questionnaires could only be answered through the Internet. In addition, the aim of the study that was mentioned in the ads could attract a selection of individuals with a certain interest in the development of new patient information. It may have attracted participants with certain motives, for instance, to be the first to get acquainted with this new information, and it may have repelled cancer patients that have no interest in such developments. In the recruitments no mention was made of social comparison information to not select participants on the basis of preferences concerning social comparison. Furthermore, a selection was deliberately provoked

by the statement that patients with incurable cancer could not participate. Therefore the effects are limited to patients in whom there was a prospect of a cure. The fact that breast cancer can be relatively often cured may be the reason that the percentage of breast cancer patients in all three studies (in Studies 1, 2, and 3: 43.9 %, 45.5%, and 52.7%, respectively) is higher than in the Dutch population (20-year prevalence 25.9%; http://www.ikz.nl/page.php?id=114). Moreover, the percentage of women among cancer patients is 56% in the general population (http://www.ikz.nl/page.php?id=114), against 70%, 68%, and 81% in Studies 1, 2, and 3, respectively. In sum, the participants in the present studies comprise some selection caused by the recruitment and procedures. Therefore, the results must not be easily generalized to the total population of former cancer patients.

A next selection may have found place after the start of the intervention in the different studies. In each study several patients dropped out of the study. This was mostly due to causes like patients' finding out that they did not meet the criteria, the death of the patient or of a relative, the questionnaire being too long, the questions being too personal or not seeming useful, and poor physical health. Non-reported data from Study 3 showed that non-responders with poor perceived health felt more threatened by a confrontation with fellow patients in comparison with the responders with poor perceived health. This suggests that the findings may only be generalized to cancer patients who do not fear confrontation with stories from fellow patients.

Future research

As explained above, one central finding of the present research was that the effects of social comparison information can be diverse. When it comes to intervention development, this finding is of utter importance. Therefore, future studies need to further deepen our insight into the underlying processes. In the above explanation of the moderation effects the main processes are assimilation and contrast of social comparison information. Below these processes will further be described and integrated with perspectives from the literature of similar concepts. Next to this, different ways of countering the negative effects of these processes in interventions will be proposed.

Low social comparison sensitivity and processing style. For patients with a low score on SCS, the following rationale is proposed: For them, processing information about others is benign and evokes no strong emotions. Therefore they can and dare to look for commonalities between themselves and the comparison other. Because their affective reaction is less pronounced the comparison may be taken in with a global look (Gasper & Clore, 2002); the level of abstraction might be high when comparing is expected to be benign (Beukeboom & Semin, 2006). They seem to focus on similarities (Mussweiler, 2003): One's own standing regarding the topic that is under evaluation is similar to that of the comparison target. A corresponding perspective would be: "What can I comprehend or interpret from this information coming from this other cancer patient who experienced a similar situation?". With such global or distal look

on the social comparison target, cancer patients have a lot in common at first glance: They have the same disease, have to deal with the same problems, see doctors, and visit the hospital. This means that individuals low in SCS might look more at 'the gestalt' when confronted with others and form in this way a representation or reflection of the comparison other (Bless & Schwarz, 2010). When the situation is perceived as a whole, especially striking similarities will become apparent. It is easy to assimilate to a similar other and the presented information will get easily integrated into the perceptual system (Föster, Liberman, & Kuschel, 2008). It is a passive intake of facts distilled from the information that is coming from others which can be conceptualized as social- or vicarious learning. The results as they occur in Studies 1 and 2 for patients with a low SCS can be explained with these kinds of assimilation processes. The patients with a low SCS and a good self-reported health status appear to assimilate downward to others who are worse off, consequently reporting a lower subjective quality of life. Those with a poor self-reported health status assimilate upward with others who are better off, with a higher subjective quality of life as a consequence.

High social comparison sensitivity and processing style. For patients with a high SCS, I propose the following rationale. These individuals indicate that they normally react with strong affect to social comparison information. The affective reaction to a certain situation determines whether it is seen as problematic or benign, and it accordingly elicits another processing style (Bless & Schwarz, 2010). When the social comparison information concerns cancer, this information can bring about emotional turmoil in these highly sensitive patients. Consequently, self-regulatory actions – such as contrasting away from the comparison other – might be activated to facilitate distancing. The focus can be actively on the differences and distinguishing between the recipient of the social comparison information and the individuals who are represented in this information. For patients high in SCS who evaluate themselves and their situation, a corresponding cognition would be: "When I compare myself with others who have cancer I distinguish myself from these other cancer patients so that I do not have to worry to become like those who die because of cancer". When a topic is signaled as problematic and can elicit a strong affective response as to the topic of cancer, the information processing can become more systematic (Schwarz, 2002; Schwarz & Clore, 2007) and the attention can shift to a lower level of abstraction (e.g., Beukeboom & Semin, 2006). It might bring effort, more extensive, and detail-oriented processing forward (Bless & Schwarz, 2010). By looking precisely at the standard of comparison, the other seems more extreme and different from oneself (Morse & Gergen, 1970); the differences between the self and the other will become magnified (Collins, 1996; Mussweiler, 2003). The results as they occur in Studies 1 and 2 for patients with a high SCS can be explained by these contrast processes. The patients with high SCS and a good self-reported health status appear to contrast downward to others who are worse off with a higher subjective quality of life as a consequence. Those with a poor self-reported health status and also a high SCS contrast upward with others who are better off and therefore they developed a lower subjective quality of life.

Thus, it seems that some patients process social comparison information in such a way that they suffer from it: Those low in SCS seem to use assimilation, while those high in SCS seem to use contrasting to protect themselves from short term agony, which, however, on the longer term may lower quality of life. One innovation in social comparison interventions may be to selectively target the mediating assimilation and contrast processes to avoid these negative effects. That is, specific processing styles are needed to create beneficial effects in patients with different characteristics. For those high in SCS, for example, it might be better to assimilate when they process information from an upward target on an emotional topic, while for those low in SCS it might be better to contrast when they process information from a downward target.

Changing assimilation and contrast processes. In general it is possible to prime a specific processing style or focus, for instance, an assimilation processing style (Higgins, Rholes, & Jones, 1977) or a contrast processing style (see Herr, Sherman, & Fazio, 1983; Lombardi, Higgins, & Bargh, 1987). Once a processing style has been elicited for a specific task, it is still in use and will affect the subsequent task that is executed and the social comparison judgments that are made (Förster, Liberman, & Kuschel, 2008). Thus, when a task needs a specific processing style to create a positive outcome it appears helpful when participants can be primed instantly with the most beneficial processing style. When these processing styles indeed can be induced, interventions for cancer patients could help to create better outcomes for those subgroups of patients who do not benefit currently. In the next three paragraphs three ways are presented of manipulating the processing style for a brief period. Future research should reveal whether these manipulations are effective in creating better outcomes for former cancer patients.

Global versus local mindset. One way of placing people in an assimilation or contrast mindset, is by priming a global versus local perspective. The global versus local perspective is based on the inclusion-exclusion model (Schwarz & Bless, 2007). Global processing produces assimilation whereas local processing produces contrast. Global processing could, for instance, be induced by instructing former cancer patients to look at the entire gestalt of a city map; local processing can be induced by the instruction to rather look at the details of the city map instead (Friedman, Fishbach, Förster, & Werth, 2003). Patients should engage in this task, right before they are exposed to the social comparison information. Another way is to use a series of Navon letters (see figure 1; Navon 1977) in which global processing is induced by asking the patients to focus on the big, overall, letters (in this case, a T) and to recall them, while local processing is induced by asking to recall the small letters (S; see Figure 1).

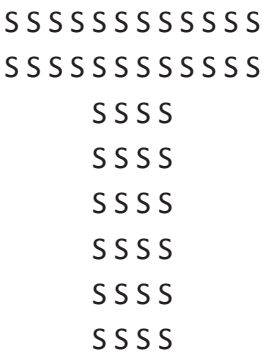

Figure 1. An example of a Navon letter (1977), used to invoke global or local processing depending on the instruction.

Similarity versus dissimilarity mindset. A second way of placing people in an assimilation or contrast mindset, is by priming a similarity versus a dissimilarity perspective. The similarity or dissimilarity mindset is based on the selective accessibility perspective (Mussweiler, et al., 2004[a]). The similarity or dissimilarity mindset can be induced (Mussweiler et al., 2004[a]) by asking cancer patients to search for similarities versus dissimilarities, for instance, in series of paired sketches (see figure 2; Mussweiler, 2001) before confronting them with social comparison information.

Collectivistic or individualistic mindset. A third way of placing people in an assimilation or contrast mindset, is by priming a collectivistic versus an individualistic perspective. Collectivism and individualism are associated with different processing styles (Oyserman et al., 2002). Assimilation is fostered with a collectivist orientation; the focus is on commonalities, connection and the identification of relationships (Oyserman & Lee, 2008). On the other hand, contrasting appears to facilitate distancing as in an individualist orientation; the focus is on distinctness, separation and uniqueness (Lee, Oyserman, & Bond, 2010). Both these mindsets can be primed, for instance, by giving the former cancer patients the task to describe oneself as similar or dissimilar to fellow cancer patients, or even to imagine them playing doubles or singles tennis or to produce plural or singular pronouns (Oyserman & Lee, 2008).

In the three aforementioned manipulations of processing styles, participants engage in a brief task that induces a specific processing mode (e.g., assimilation or contrasting) that influences the way they engage in a subsequent task. However, manipulations that are administered before the task might only work in subsequent brief tasks: The processing style that is induced before the task will probably be short-lived. The expectation is that the induced processing style will decay after a while and will thus be of little influence, and the original dominant processing style will take over again. This probably will be especially the case when the topic of the second task is intensive (i.e., listening to a 20-minute interview about a life-

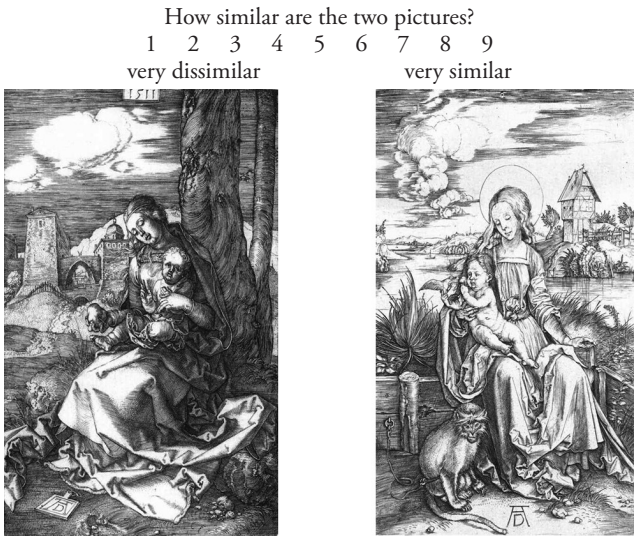

Figure 2. With the question belonging to these two pictures the researcher chooses to induce a similarity mindset.

threatening disease like cancer). One way to overcome this problem is to induce the processing style during the total exposure time to the social comparison information. This might be accomplished in different ways.

Extreme versus corresponding standard. One way to induce contrasting that lasts is by designing the social comparison information in such a manner that the comparison target is extreme and is not like the individual at all. An extreme and contrasting standard, thus, a fellow cancer patient that is largely different from the cancer patient him- or herself, will evoke contrasting processes when comparing (see Herr, et al., 1983; Manis, Nelson, & Shedler, 1988; Mussweiler, et al., 2004[a] ; 2004[b]). A 40 year old woman, for example, with breast cancer who never smoked and with a profession as a sports teacher would probably not be able to assimilate with a 75 year old man with lung cancer who smoked since he was young and who had a sedentary lifestyle, had been working as an accountant, and is now retired. On the other hand, assimilation can be provoked likewise by designing social comparison information that totally corresponds with the specific cancer patient. This could be achieved by using computer tailoring that makes it possible to adapt social comparison characteristics to each cancer patient. A corresponding standard, thus, someone who equals the comparer in all relevant characteristics, may probably prevent contrasting and may evoke assimilation processes. However, it seems that the extent and type of tailoring that was used in the present studies was not sufficient to induce assimilation that could overrule the individual inclination of some patients to contrast. Thus, a lot has to be learned about the effects of computer-tailored levels of social comparison target similarity.

Triggering the desired mindset. Another way to induce a contrast or assimilation process is to give the former cancer patients a specific information processing goal that triggers them

to use a specific desired mindset. This mindset, the induced goal, then provokes the desired process during the total exposure time of processing the social comparison information. When the desired process is to assimilate, patients could explicitly be asked to focus on similarities between themselves and the fellow patient(s) during the whole comparison task. To shift their focus to similarities, patients could receive an introduction like: "Although people can differ from each other on certain aspects they mainly have a lot in common. When you listen well to the provided interview you will notice that you and the fellow patients from the interview have a lot in common. Please write down as many similarities as you can discover". Such an induction of the goal to assimilate might be applied in patients with a poor self-reported health status and high SCS. This might be effective (increase quality of life) to the extent to which the information processing effects of the goal overrule the inclination to contrast.

Likewise, when the desired process is contrasting, cancer patients could be asked to focus on dissimilarities: "Although people seem to have a lot in common, when you listen well to the provided interview you will notice that there are mainly differences between yourself and the fellow patients from the interview. Please write down as many dissimilarities as you can discover". Such an induction of the goal to contrast might be applied in patients with a good self-reported health status and low SCS. Again, this might be effective to the extent to which the information processing effects of the goal overrule the inclination to assimilate. These extra manipulations can be included in the social comparison intervention to achieve better results.

In sum, the processes of assimilation and contrast seem conceptually related to several other psychological processes. Together they provide a refined picture of the processes that may have been at play in the present studies among former cancer patients. Future studies should test whether these broadly defined assimilation and contrasts processes can be held responsible for the positive as well as negative effects of social comparison information in cancer patients. Our knowledge on assimilation and contrast processes may help to design intervention elements that avoid the possible negative effects of social comparison. Therefore, future studies should test whether applying these intervention elements is effective and practically feasible.

Conclusion

The three field-experiments among cancer survivors yielded interpretable patterns of outcomes, although few intermediary processes were assessed. Theoretical explanations were needed to understand the development of the patterns of outcomes on quality of life and life satisfaction. Still, this research answered some important questions, for example: "Is there a difference in effects between different types of social comparison information?" and "Are individual differences relevant when processing social comparison information?". These questions were answered in the theoretical framework of making social comparisons as one, albeit important, way that people have at their disposal to psychologically construe their own perspective on life.

However, several new questions were raised, for example "How did tailoring the information influence the effects?", and "How robust are the findings of Study 3 on the moderating

effects of illness beliefs?". In addition: "When future interventions become matched to these moderators, will there be new moderators?". Another problem that was left concerns the selection of patients: The studies I conducted were among a certain selection of cancer patients and we cannot answer with certainty to what extent the results can be generalized to all patients who are exposed to social comparison information on the Internet. Thus, scientifically, the present studies provide only one set of data and interpretations that are meant to inspire new research in a long process of "discovering" the psychological laws of the human mind.

The present work may also have practical meaning: It may contribute to the field of psycho-social interventions in cancer patients that is still evolving (Coyne, Thombs, & Hagedoorn, 2010; Lepore & Coyne, 2006; Zimmerman, Heinrichs, & Baucom, 2007). From the current work the conclusion can be drawn that social comparison information can have an effect on the quality of life of cancer survivors, which is in line with the effects of social comparison information in cancer patients being treated (Bennenbroek et al., 2003). This mounting evidence suggests that social comparison information, not only as normative information but also as idiosyncratic information from individual people, can be regarded as a powerful working mechanism of psycho-social interventions for cancer patients.

The above implies that it has "changing-potential" and should be applied with care. Indeed, the three field-experiments highlight the importance of taking individual differences into account when utilizing social comparison interventions. There seem to be several different ways of receiving the same social comparison information in a way that the information leads to different effects; it can have positive effects, no effects, but also negative effects on quality of life. The discovery of the negative effects of social comparison information was unexpected but it draws our attention to the possibility that psycho-social interventions, even those of low-intensity, may have negative side-effects. These negative effects might even be one cause of the mixed findings on the effects of psycho-social interventions for cancer patients (Pool, 2009). Knowledge of the specific detrimental psychological processes that are involved may help to avoid these effects. This problem also brings the urgent need to more broadly study the negative effects of psycho-social interventions in cancer patients.

In the practice of psycho-social interventions, social comparison information might be part of an intervention package containing more types of information, for example, psycho-education. In this case, the social comparison information must be designed in relation to the other types of information, further complicating its application. The present findings can also be used to further professionalize psycho-oncological treatments for cancer patients: In practice, health professionals should be aware of the possible diverse effects of social comparison information to be able to properly supervise patients. Lastly, the present findings might also inspire the use of social comparison interventions in different settings, other physical illnesses, psychiatric disorders, and bereavement.

To conclude, the data gathered in this project must be perceived in the context of the two complementary perspectives, science and practice, highlighting the complexity of the human psychological functioning and of our endeavor to influence the human experience for the good.

Footnote

[1]The internal consistencies of the quality of life measures in Study 1 ($\alpha_{pre} = .90$; $\alpha_{post} = .93$), in Study 2 ($\alpha_{pre} = .86$, $\alpha_{post} = .92$), and in Study 3 ($\alpha_{pre} = .85$; $\alpha_{post} = .87$) were good. Good concurrent validity was suggested by substantial and significant correlations with the measure of life satisfaction in all three studies ($r = .72$; $r = .62$; $r = .63$, respectively) and the measure of perceived physical status, which was comprised of the other 28 EORTC items ($r = -.72$; $r = -.61$; $r = -.65$, respectively). In addition, in Studies 1 and 2, our quality of life measure correlated significantly with the Satisfaction With Life Scale ($r = .68$; $r = .69$). Another indication of validity is that the quality of life composite scale correlated significantly but moderately with perceived control in Studies 1 and 2 ($r = .46$; $r = .30$, respectively; Ferrell, Dow, & Grant, 1995). In sum, although the quality of life measure was not an established measure, it was composed of established measures, it had good reliability, the available data supported its validity, and it seemed able to grasp the changes in psychological constructions of reality in all three studies.

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Dutch Summary

Nederlandse Samenvatting

Er zijn tegenwoordig veel kankerpatiënten die een proces van herstel na de ziekte doormaken. Deze herstelfase gaat vaak gepaard met angst en een lagere kwaliteit van leven vanwege de problemen waarmee herstellende patiënten geconfronteerd worden nadat hun behandeling voltooid is. Dat de behandeling voltooid is kan psychologisch een negatieve invloed hebben op patiënten: De actieve betrokkenheid van professionals in de gezondheidszorg is gestopt, en de angst voor terugkeer van de kanker kan zich ontwikkelen. Patiënten moeten zich daarnaast aanpassen aan nieuwe sociale rollen en ze hebben te maken met lichamelijke beperkingen en klachten. Om met deze situatie om te kunnen gaan, kunnen patiënten spontaan proberen om hun beeld van de werkelijkheid op een positieve manier aan te passen door gebruik te maken van verschillende psychologische mechanismen, of ze kunnen in het gebruik ervan gestimuleerd of ondersteund worden.

Een relevant psychologisch mechanisme waarvan bekend is dat het kankerpatiënten kan steunen, is sociale vergelijking: Patiënten die aan het herstellen zijn van kanker kunnen zichzelf vergelijken met andere herstellende patiënten om informatie te vergaren die kan bijdragen aan het verbeteren van de ervaren kwaliteit van leven en de tevredenheid met het leven. Echter, individuele verschillen kunnen een bepalende invloed hebben op hoe kankerpatiënten reageren op de sociale vergelijkingsinformatie en of ze kunnen profiteren van de informatie of niet. In dit proefschrift wordt onderzocht of individuele verschillen in de persoonlijk ervaren gezondheidstoestand en de sociale vergelijking gevoeligheid (SVG) betrokken zijn bij hoe sociale vergelijkingsinformatie de kwaliteit van leven van kankerpatiënten kan beïnvloeden. De zelf-waargenomen persoonlijke gezondheidstoestand bepaalt of patiënten in staat zijn om neerwaartse of opwaartse sociale vergelijkingen te maken. Er wordt aangenomen dat patiënten die er slecht aan toe zijn zichzelf voornamelijk kunnen vergelijken met anderen die het beter doen omdat er verhoudingsgewijs weinig anderen zullen zijn die het even slecht of nog slechter doen. Degenen die er goed aan toe zijn zullen gedwongen zijn om zichzelf voornamelijk te vergelijken met anderen die slechter af zijn.

Het effect dat deze opwaartse of neerwaartse vergelijkingen hebben op de kwaliteit van leven en de tevredenheid met het leven van de patiënt hangt mogelijk af van een tweede moderator, de SVG. Het idee is dat kankerpatiënten met een lage SVG het standaard vergelijkingsproces in zullen zetten: dat van het observeren van gelijkenissen. Omdat de focus ligt op de overeenkomsten tussen de patiënt zelf en de medekankerpatiënten zal de gepresenteerde sociale vergelijkingsinformatie vermoedelijk worden geassimileerd. Dit betekent dat in het geval van een opwaartse vergelijking deze vergelijking kan leiden tot hoop om hetzelfde te zijn of net zo te worden als die ander waarmee het beter gaat, waardoor naar verwachting de kwaliteit van leven en de tevredenheid met het leven zullen verbeteren. Door assimilatie zou een neerwaartse vergelijking echter kunnen leiden tot angst om net als deze ander te worden die slechter af is, wat een lagere kwaliteit van leven en tevredenheid met het leven tot gevolg kan hebben.

Kankerpatiënten met een hoge SVG geven aan sterke emoties te ervaren bij sociale vergelijkingen. Daarom is het mogelijk dat zij zullen verwachten saillante negatieve emoties te ervaren bij sociale vergelijkingsinformatie rond zoiets ingrijpends als kanker. Dit zou het proces van contrasteren kunnen activeren - in plaats van het gebruikelijke assimilatieproces - om zodoende de

negatieve gevoelens te verlagen. Bij dit contrasteren ligt de nadruk op de verschillen tussen henzelf en de medepatiënten. Een opwaartse vergelijking kan daarom leiden tot teleurstelling omdat ze gewaarworden niet zo goed af te zijn als de medepatiënten, met als gevolg een daling van de kwaliteit van leven en tevredenheid met het leven. In een neerwaartse vergelijking contrasteren kan deze gevoelige patiënten het idee geven beter af te zijn dan de meeste andere medepatiënten, wat leidt tot een hogere kwaliteit van leven en meer tevredenheid met het leven.

Drie veldexperimenten werden uitgevoerd met herstellende kankerpatiënten om te exploreren of individuele verschillen in de persoonlijk ervaren gezondheidstoestand en de SVG modererende effecten hebben op de kwaliteit van leven (Studie 1 en 2; zie Tabel 1) en de tevredenheid met het leven (Studie 1). Verder werd getoetst of een interventie waarbij rekening wordt gehouden met de gevonden effecten uit deze eerste twee onderzoeken kan bijdragen aan kwaliteit van leven en de tevredenheid met het leven vergeleken met een controlegroep die geen sociale vergelijkingsinformatie krijgt (Studie 3; zie Tabel 1). In een naturalistische setting bevat sociale vergelijkingsinformatie van medepatiënten meestal twee soorten informatie: Ten eerste informatie over de negatieve emoties die worden ervaren en daarnaast informatie over het omgaan met de moeilijke situatie. In de huidige studies werden deze twee soorten sociale vergelijkingsinformatie onderscheiden en de patiënten kregen: 1) of informatie over alleen emoties; 2) of informatie alleen over het omgaan met de situatie (coping); 3) of een combinatie van beide soorten informatie.

In Hoofdstuk 2 wordt de eerste studie beschreven. Kankerpatiënten (N= 139) die herstellende waren van kanker na behandeling in een ziekenhuis reageerden op een oproep in de media om deel te nemen aan het onderzoek. In drie experimentele condities – elk met één soort van de drie mogelijke soorten van sociale vergelijkingsinformatie – kregen ze een audiointerview van 20 minuten met sociale vergelijkingsinformatie van twee medepatiënten. De medepatiënten hadden aan dezelfde kankersoort geleden, waren van hetzelfde geslacht en ongeveer van dezelfde leeftijd als de deelnemende kankerpatiënt. In de controlegroep ontvingen de patienten een even lang durende CD met gitaarmuziek en een melodieuze stem (zonder woorden). Patiënten werden willekeurig toegewezen aan één van deze vier condities en werden gevraagd tenminste eenmaal naar het audiomateriaal te luisteren. De kwaliteit van leven en tevredenheid met het leven werden gemeten tijdens een voormeting, en drie weken en twee maanden nadat de sociale vergelijkingsinformatie was opgestuurd.

De belangrijkste bevinding was dat zowel de gevoeligheid van de kankerpatiënten voor de sociale vergelijkingsinformatie als hun zelf-gerapporteerde gezondheidstoestand de effecten van sociale vergelijkingsinformatie op kwaliteit van leven en tevredenheid met het leven modereerden. Patiënten met een hoge SVG profiteerden van de sociale vergelijkingsinformatie als ze vonden een goede gezondheid te hebben en patiënten met een lage SVG als ze vonden dat ze in een slechte gezondheidstoestand verkeerden. Het zou mogelijk kunnen zijn dat neerwaarts contrast en opwaartse assimilatie, respectievelijk, de processen zijn die verantwoordelijk zijn voor de positieve verschuiving in de subjectieve kwaliteit van leven en tevredenheid met het leven, twee maanden later. Bij patiënten die niet gevoelig zijn voor sociale vergelijkingsinformatie en die een

goede ervaren gezondheidstoestand hadden, nam de kwaliteit van leven en de tevredenheid met het leven af, dit gebeurde evenzo bij gevoelige patiënten met een slechte ervaren gezondheidstoestand. Mogelijk dat deze negatieve verschuiving ontstaan is doordat respectievelijk de processen opwaarts contrast en neerwaartse assimilatie plaats vonden.

Dus de ervaren gezondheidstoestand en sociale vergelijkingsgevoeligheid bleken moderatoren te zijn voor het verschil in effect van de sociale vergelijkingsinformatie op de subjectieve kwaliteit van leven en de tevredenheid met het leven bij kankerpatiënten in hun herstelfase. Dit effect was het meest uitgesproken in de combinatieconditie. In deze studie werd de sociale vergelijkingsinformatie in de drie experimentele condities gegeven door medepatiënten. Echter, deze informatie kan als zeer specifiek worden beschouwd omdat het van slechts twee andere patiënten komt, waardoor het een beperkte geldigheid kan hebben voor sommige patiënten. Daarom werd in Studie 2 het effect van gegeneraliseerde sociale vergelijkingsinformatie onderzocht.

In Studie 2, zoals beschreven in Hoofdstuk 3, was de bron van de sociale vergelijkingsinformatie een klinisch expert op het gebied van de psycho-oncologie die vertelde over de emotionele ervaringen van kankerpatiënten in het algemeen en/of over hoe ze omgingen met hun moeilijke situatie (coping). Opnieuw werden in respectievelijk drie condities één van de drie soorten van sociale vergelijkingsinformatie afzonderlijk gegeven (alleen emoties, alleen coping of de combinatie van emoties en coping). In het 20 minuten durende audiomateriaal werd de sociale vergelijkingsinformatie in de vorm van een interview met de expert weergegeven. Een vierde conditie was toegevoegd als controle conditie waarin de patiënten sociale vergelijkingsinformatie ontvingen van een geïnterviewde medepatiënt waarbij tegelijkertijd het soort informatie (alleen emoties, alleen coping of de combinatie) was aangepast aan elke individuele deelnemer aan de hand van de resultaten van Studie 1. Patiënten ($N = 154$) werden willekeurig toegewezen aan één van deze vier condities. Ze werden gevraagd tenminste eenmaal te luisteren naar het audiomateriaal dat werd aangeboden in de conditie waaraan ze waren toegewezen. De kwaliteit van leven werd gemeten tijdens de voormeting en drie weken en twee maanden na het beschikbaar stellen van de sociale vergelijkingsinformatie.

De resultaten uit de eerste studie werden gerepliceerd: Opnieuw bleken de gevoeligheid voor sociale vergelijkingsinformatie en de zelf-gerapporteerde gezondheidstoestand van patiënten moderatoren te zijn voor de effecten van sociale vergelijkingsinformatie op de kwaliteit van leven. Opnieuw profiteerden patiënten met een hoge SVG en een hoge gepercipieerde gezondheidstoestand en patiënten met een lage SVG en een slechte gepercipieerde gezondheidstoestand. Bij deze groepen patiënten trad een positieve verschuiving op in de subjectieve kwaliteit van leven, twee maanden later. Net als bij Studie 1 nam de kwaliteit van leven af bij patiënten met een lage SVG en een goede gepercipieerde gezondheidstoestand en bij patiënten met een hoge SVG en een slechte gepercipieerde gezondheidstoestand .

Daarnaast leidden de condities met een deskundige bron met gegeneraliseerde informatie in het algemeen niet tot een significante verbetering of verslechtering van de kwaliteit van leven in vergelijking met de controle conditie met specifieke informatie van één kankerpatiënt. Het kon dus niet algemeen aangetoond worden dat gegeneraliseerde sociale vergelijkingsinfor-

matie bij sommige groepen meer invloed had dan specifieke sociale vergelijkingsinformatie. Opnieuw had de sociale vergelijkingsconditie waarbij de ervaren emoties gecombineerd werden met coping-strategieën de meest uitgesproken effecten op de kwaliteit van leven.

In Studie 3, zoals beschreven in Hoofdstuk 4, werd een op maat gemaakte sociale vergelijkingsinformatie-interventie ontwikkeld op basis van de resultaten van Studie 1 en 2. Deze interventie bood individuele patiënten sociale vergelijkingsinformatie aan die zo effectief mogelijk was, gezien hun individuele kenmerken. Zowel de soort informatie (emoties, coping of de combinatie) als de bron van de informatie (medepatiënt versus expert) was aangepast aan hun individuele kenmerken. Dit werd gedaan op basis van de vastgestelde cutoff scores bij de individuele verschillen in ervaren gezondheidstoestand en SVG. Herstellende kankerpatiënten ($N = 150$) werden geworven via een oproep in de media en na aanmelding werden ze willekeurig toegewezen aan deze interventie conditie, of aan een conditie waarin zij geen informatie ontvingen. Bij alle deelnemers werd een baseline meting (pre-test) verricht en na twee maanden een nameting.

Er werd getest of de gevolgen van de op maat gemaakte interventie afhingen van de mate waarin patiënten een positieve kijk op hun situatie betreffende hun ziekte te construeren. De hypothese was dat alleen wanneer de patiënten nog niet een positief perspectief hadden van hun situatie, de op maat gemaakte sociale vergelijkingsinformatie gunstig zou zijn. Als ze al een positieve kijk op hun situatie hadden dan werd verwacht dat de informatie geen verdere gevolgen voor de kwaliteit van leven en de tevredenheid met het leven zou hebben. Dit individuele verschil werd gemeten met twee representaties van ziekte; de ene ging over hoe optimistisch patiënten waren over hun toekomstige gezondheid en de andere over hoe bedreigend patiënten hun huidige situatie ervaren met betrekking tot de kanker.

De resultaten laten zien dat wanneer herstellende kankerpatiënten een slechte gezondheidsverwachting hadden, de sociale vergelijkingsinformatie hen hielp om twee maanden later een meer positieve subjectieve kwaliteit van leven te construeren. Ook als patiënten een hoge levensbedreiging ervoeren was luisteren naar de sociale vergelijkingsinformatie gunstig. Het hielp de patiënten een hogere tevredenheid met het leven te construeren. Echter, wanneer de patiënten een *positieve* gezondheidsverwachting hadden of een *lage* levensbedreiging, was het luisteren naar de sociale vergelijkingsinformatie niet gunstig in het verhogen van hun kwaliteit van leven en de tevredenheid met het leven; het had zelfs negatieve effecten.

De belangrijkste conclusie die kan worden getrokken uit dit onderzoek is dat patiënten die zelf in staat waren om een aanvaardbare positieve ziekterepresentatie te creëren beter niet geconfronteerd kunnen worden met sociale vergelijkingsinformatie, want dit kan hun psychologische status quo verstoren. Voor patiënten die zelf niet in staat waren een aanvaardbare positieve ziekterepresentatie te creëren kan een sociale vergelijkingsinterventie zoals in deze studie werd gebruikt, helpen om een positievere kijk te creëren met een hogere kwaliteit van leven en levenssatisfactie als gevolg.

Bij alle drie de onderzoeken kan de conclusie worden getrokken dat een korte blootstelling aan sociale vergelijkingsinformatie van één of twee medepatiënten of een deskundige op het gebied van psycho-oncologie, een effect kan hebben op de kwaliteit van leven van kankerpatiën-

ten twee maanden later. Als alleen naar hoofdeffecten wordt gekeken zou de conclusie getrokken kunnen worden dat sociale vergelijkingsinformatie geen effect heeft op de kwaliteit van leven van kankerpatiënten; deze effecten komen pas naar voren wanneer individuele verschillen als moderatoren in aanmerking worden genomen. Daarom zou men zich er bij het toewijzen van psycho-oncologische interventies bewust moeten zijn van deze individuele verschillen. Als het om lotgenotencontact gaat of als een expert verteld over andere kankerpatiënten in het algemeen is het van belang hier bewust van te zijn, om nadelige effecten te voorkomen. Suggesties over hoe de negatieve effecten te voorkomen zijn d.m.v. het toevoegen van nieuwe interventie-elementen worden in het laatste hoofdstuk besproken. Echter meer onderzoek is nodig om te testen of dergelijke interventies in de praktijk haalbaar en effectief zijn.

Tabel 1. *Overzicht van de 3 Gerandomiseerde Veldexperimenten.*

	Studie 1	**Studie 2**	**Studie 3**
Aanmelding	73% via Internet en 27% via de telefoon	100% via Internet	100% via Internet
Mogelijkheden voor het beantwoorden van de vragenlijsten	Pen & papier of computer	Pen & papier of computer	Computer
Uitval (tussen de voormeting en de nameting 2 maanden later)	22%	21%	19%
Procesmeeting	Ja	Ja	Nee
Voormeting	Ja	Ja	Ja
Meting na 3 weken	Ja	Ja	Nee
Meting na 2 maand	Ja	Ja	Ja
Duur tussen de voormeting en de interventie	Ongeveer 1 week	Ongeveer 1 week	Een paar seconden
Aantal participanten	139	154	150
Leeftijdsrange in jaren	21 tot 85	27 tot 83	19 tot 82
Gemiddelde leeftijd	52	55	52
SD	12.51	11.11	11.41
Percentage vrouwen	70.5%	67.6%	81%
Percentage borst-kanker participanten	43.9%	45.5%	52.7%
Controle conditie	CD met ontspannende gitaar muziek en melodieuze stem (geen tekst)	Interview via computer met 1 patiënt; type sociale vergelijking aangepast op basis van de resultaten van Studie 1	Ontvingen niets maar wisten dat andere participanten informatie ontvingen
Interventie conditie(s)	-Patiënt negatieve emoties -Patiënt coping -Patiënt emoties + coping (combinatie)	-Expert negatieve emoties -Expert coping -Expert emoties + coping (combinatie)	Bron en soort van sociale vergelijking aangepast op basis van de resultaten van Studie 1 + 2

	Studie 1	**Studie 2**	**Studie 3**
Sociale vergelijking in de experimentele conditie(s):			
– Bron	2 patiënten	1 expert	2 patiënten óf 1 expert
– Onderwerpen	8	1 + keuze van 4 uit 7	Ofwel 8 (patiënt) of 1 + keuze van 4 uit 7 (expert)
– Duur	20 minuten	20 minuten	20 minuten
– Aanpassing	Geslacht, kankersoort en leeftijd	Geslacht en kankersoort	Geslacht, kankersoort en indien patiëntscript ook leeftijd
Onderzoeksopzet	Pilottest gevolgd door gerandomiseerd veldexperiment	Gerandomiseerd veldexperiment	Gerandomiseerd veldexperiment
Onafhankelijke variabele	Conditie	Conditie	Conditie
Covariaat	Kwaliteit van leven op T1 en tevredenheid op T1	Kwaliteit van leven op T1	Kwaliteit van leven op T1 en tevreden-heid op T1
Afhankelijke variabele(n)	Kwaliteit van leven op T3 en tevredenheid op T3	Kwaliteit van leven op T3	Kwaliteit van leven op T3 en tevredenheid op T3
Moderatoren	-Ervaren gezondheidstoestand -Sociale vergelijkings-gevoeligheid -Sociale vergelijkings-oriëntatie -Ervaren controle	-Ervaren gezondheidstoestand -Sociale vergelijkings-gevoeligheid positieve interpretatie	-Gezondheids-verwachtingen -Ervaren levensbedreiging
Match-mismatch test Cohen's *d* effect size	0.74, wat wijst op een effect dat bijna sterk genoemd kan worden (berekend voor het niveau van sociale vergelijkings-gevoeligheid en de ervaren gezondheidstoestand)	0.57, wat wijst op een gemiddeld effect (berekend voor het niveau van sociale vergelijkings-gevoeligheid positieve interpretatie en ervaren gezondheidstoestand; ongepubliceerde gegevens)	0.53, wat wijst op een gemiddeld effect bij gezondheids-verwachtingen 0.43, wat wijst op een bijna gemiddeld effect voor de ervaren levensbedreiging

English Summary

Engelse Samenvatting

Nowadays, many cancer patients go through the process of recovery from illness. This recovery phase often comes with distress and a lowered quality of life because of the challenges former patients face after treatment completion. Treatment completion can be disruptive psychologically for patients because their active engagement with health care professionals is finished, they often fear recurrence of the cancer, they have to adapt to new social roles, and they have to cope with physical impairments and complaints. To cope with this situation, patients may spontaneously try to construe their perception of reality in a positive direction by different psychological mechanisms or they may be stimulated or supported in doing so.

One relevant psychological mechanism known to support cancer patients is social comparison: Recovering patients can compare themselves to other recovering patients to gather information that may contribute to their experienced quality of life and life satisfaction. However, individual differences may determine how they react to the social comparison information and, thus, whether they benefit from it or not. In this thesis, individual differences in the perceived own health status and social comparison sensitivity (SCS) may be involved in the construction of quality of life due to social comparison information. That is, the perceived own health status determines whether patients will be able to make downward or upward social comparisons. Patients doing poor are constrained to compare themselves with others doing better because there are relatively few others who are similarly poor off, let alone worse off. Those who are doing well are constrained to compare themselves to others who are doing worse.

The effect that these upward or downward comparisons will have on the patient's quality of life and life satisfaction possibly depends on a second moderator, the SCS. Cancer patients *low in SCS* are thought to use the default comparison process of similarity testing. Because the focus is on similarities between themselves and the fellow cancer patients, the presented social comparison information gets assimilated. This means that in case of an upward comparison this comparison could lead to hope of being similar or becoming like this better doing other, which can be expected to increase the quality of life and life satisfaction. Through assimilation, a downward comparison could lead to fear of becoming like this worse off other, with a lower quality of life and life satisfaction as a consequence. Cancer patients *high in SCS* indicate to normally react with strong affect towards social comparisons. Therefore, it can be that these patients expect to experience salient negative emotions towards social comparison information concerning something poignant as cancer. This may activate the use of the process of contrast, instead of the accustomed process of assimilation, to down-regulate the negative emotions. When contrasting, the focus is on the differences between themselves and fellow patients. An upward comparison could therefore lead to the disappointment of not being so well off as the fellow patients, with a consequence a drop in quality of life and life satisfaction. A downward comparison could give these sensitive patients the idea of being better off than most other fellow patients, leading to a higher quality of life and life satisfaction.

Three field-experiments among former cancer patients were conducted to explore whether individual differences in perceived own health status and SCS have moderating effects on quality of life (Studies 1 and 2; see Table 1) and life satisfaction (Study 1). Additionally, it

was tested whether an intervention that takes into account the effects found in these first two studies can contribute to the quality of life and life satisfaction compared to usual care (Study 3). In naturalistic settings, social comparison information from fellow patients mostly contains two types of information: information on the negative emotions experienced and information on coping with the difficult situation. In the present studies, these two types of social comparison information were distinguished, and patients received information 1) on emotions-only or; 2) on coping-only or; 3) on a combination of emotions and coping.

In Chapter 2, the first study was described. Cancer patients (*N*=139) who recovered from cancer after treatment in a hospital responded to a call in the media to participate in the study. In three experimental conditions – each with one type of social comparison information – they received an audio interview of 20 minutes with social comparison information of two fellow patients. The fellow patients had suffered from the same type of cancer, and had the same gender, and about the same age as the participating cancer patient. In a control condition patients received a CD with guitar music and melodious voice (no words spoken) of similar duration. Patients were randomly assigned to one of these four conditions and they were asked to listen to the audio material in their condition at least once. Quality of life and life satisfaction were measured at pre-test, and three weeks and two months after being send the social comparison information.

The core finding was that the cancer patients' sensitivity to social comparison information and their perceived own health status moderated the effects of social comparison information on the quality of life and life satisfaction. Highly sensitive patients with a good perceived health status benefited from the social comparison information, so did the low sensitive patients with poor perceived health status. It is possible that downward contrast and upward assimilation, respectively, are the processes responsible for the positive shift in subjective quality of life and life satisfaction assessed after two months. In patients who were not sensitive to social comparison information and who had a good perceived health status, quality of life diminished, as in sensitive patients with a poor perceived health status. Here it could be that upward contrast and downward assimilation, respectively, are the responsible processes for this negative shift.

Thus, perceived health status and social comparison sensitivity were identified as moderators responsible for the differences in effect of the social comparison information on subjective quality of life and life satisfaction in cancer patients in their recovery phase. This effect was most pronounced in the combination condition. In this study, the social comparison information in the three experimental conditions was provided by fellow patients. However, this information may be regarded as highly idiosyncratic because only two other patients are involved, thereby limiting the validity for some patients. Therefore, in Study 2, the generality of the social comparison information was addressed.

In Study 2, reported in Chapter 3, the source of the social comparison information was a clinical expert in the field of psycho-oncology who told about the emotional experiences of cancer patients in general and/or about how they cope with their difficult situation. Again, in three respective conditions one of the three types of social comparison information were provided separately (emotions-only, coping-only, or the combination of emotions and coping).

The 20 minute audio recording presented the social comparison information in the format of an interview with the expert. A fourth condition was added as a control condition, in which patients received social comparison information from an interviewed fellow patient while at the same time the type of information (emotions-only, coping-only, or the combination) was adapted to each individual participant on the basis of the results of Study 1. Patients (N=154) were randomly assigned to one of these four conditions and they were asked to listen to the audio material in their condition at least once. Quality of life was measured at pre-test, and three weeks and two months after being send the social comparison information.

The findings of the first study were replicated: Patients' sensitivity to social comparison information and the self-reported health status were moderators of the effects of social comparison information on the quality of life of patients. Again patients with a high SCS and a good perceived health status benefitted from the social comparison information, as did patients with a low SCS and a poor health status. In these groups of patients a positive shift in subjective quality of life was demonstrated two months later. Like in Study 1, quality of life decreased in patients with a low SCS accompanied with a good perceived health status and in patients with a high SCS and a poor perceived health status.

Furthermore, the conditions with an expert that conveyed generalized patient information did not lead to a significant increase or decrease of quality of life in general as compared to the control condition in which adapted idiosyncratic information from one cancer patient was presented. It could therefore not be demonstrated that generalized social comparison information had more influence than specific social comparison information in some groups. Again, the social comparison condition that combined experienced emotions with coping strategies had the most pronounced effects on quality of life.

In Study 3, reported in Chapter 4, a tailored social comparison information intervention was developed on the basis of results of Studies 1 and 2. This intervention provided patients with the type (emotions-only, coping-only or the combination) and source of information (fellow patient versus expert) that was most effective for them. This was done using cut-off scores for individual differences in perceived health status and SCS, based on the results of Studies 1 and 2. Former cancer patients (N= 150) were recruited through a call in the media and after registration they were randomly assigned to this intervention condition or a condition in which they received no information. In both conditions a baseline (pre-test) measurement and a two month follow-up measurement were conducted.

It was tested whether the effects of the tailored intervention depended on the extent to which patients had already accomplished to construe a positive outlook on their situation or not. It was hypothesized that only when patients do not yet have a positive perspective of their situation, the tailored social comparison information will be beneficial. When they already have a positive outlook on their situation the information will have no further effects on quality of life and life satisfaction. This individual difference was assessed with two illness representations; one about how optimistic patients perceived their future health and one about how threatening patients perceived their present situation concerning cancer.

The results show that when former cancer patients had a poor future health expectation, the social comparison information helped them to construct a more positive subjective quality of life two months later. In addition, when patients perceived a present high life threat the social comparison information was also beneficial; it helped patients to construct a higher life satisfaction. However, when patients had a *positive* future health expectation or a *low* life threat, social comparison information was not beneficial in increasing their quality of life and life satisfaction, respectively; it even was detrimental to them.

The main message that could be drawn from this study is that patients who were able to create an acceptable positive illness representation should not be confronted with social comparison information because this can disturb their psychological status quo. For patients, however, who had not been able to create an acceptable positive illness representation, a social comparison intervention, as was used in this study, can help to create a better outlook with a higher quality of life and life satisfaction as a consequence.

From all three studies the conclusion can be drawn that a brief exposure to social comparison information from one or two fellow patients or passed on by an expert in the psycho-oncology field, can have an effect on the quality of life of cancer patients up to two months later. Looking only at main effects one could draw the conclusion that social comparison information has no effect on cancer patients' quality of life; these effects were only revealed when individual differences were taken into account as moderators. Therefore, in psycho-oncological interventions one should be aware of these individual differences. When there is contact with fellow patients or when an expert talks about other patients in general, awareness about possible detrimental effects is important. Suggestions on how to prevent these kinds of effects are given in the final chapter. More research is, however, needed to test whether applying intervention elements that are designed to prevent negative outcomes of psycho-oncological interventions is feasible and effective in practice.

Table 1. Summary of the 3 Randomized Field Studies.

	Study 1	**Study 2**	**Study 3**
Sign up	73% Internet and 27% by telephone	100% Internet	100% Internet
Possibilities for answering questionnaires	Pencil & paper or computer	Pencil & paper or computer	Computer
Dropout rate (from pre-test to two months follow-up)	22%	21%	19%
Process measure	Yes	Yes	No
Pre-test	Yes	Yes	Yes
Post-test at 3 weeks	Yes	Yes	No
Post-test at 2 months	Yes	Yes	Yes
Time between pre-test and intervention	Approximately 1 week	Approximately 1 week	

	Study 1	**Study 2**	**Study 3**
Number of participants	139	154	150
Age range in years Mean age SD	21 to 85 52 12.51	27 to 83 55 11.11	19 to 82 52 11.41
Percentage of women	70.5%	67.6%	81%
Percentage of participants with breast cancer	43.9 %	45.5%	52.7%
Control condition	CD with relaxing guitar music and melodious voice (no text)	Interview via computer with 1 patient; type of social comparison adapted on bases of the results of Study 1	Received nothing but knew that other participants received information
Intervention condition(s)	-Patient negative emotions -Patient coping -Patient emotions + coping (combination)	-Expert negative emotions -Expert coping -Expert emotions + coping (combination)	Source and type of social comparison adapted on bases of the results of Studies 1 + 2
Social Comparison in the experimental condition(s):			
– Source	2 patients	1 expert	Either 2 patients or 1 expert
– Topics	8	1 + choosing 4 out of 7	Either 8 (patient) or 1 + choosing 4 out of 7 (expert)
– Duration	20 minutes	20 minutes	20 minutes
– Tailoring	Gender, type of cancer, and age	Gender and type of cancer	Gender, type of cancer, and if patient script also age
Study design	Pilottest followed by randomized field experiment	Randomized field experiment	Randomized field experiment
Independent variable	Condition	Condition	Condition
Covariate	Quality of life at T1 and life satisfaction at T1	Quality of life at T1	Quality of life at T1 and life satisfaction at T1
Dependent variable(s)	Quality of life at T3 and life satisfaction at T3	Quality of life at T3	Quality of life at T3 and life satisfaction at T3
Moderators	Health status SCS SCO Perceived control	Health status SCS positive interpretation	Health expectations Perceived life threat
Match-mismatch test Cohen's *d* effect size	0.74, indicating an almost large effect (calculated for level of SCS and level of health status)	0.57, indicating a medium effect (calculated for level of SCS positive interpretation and level of health status; unpublished data)	0.53, indicating a medium effect calculated for level of health expectations 0.43, indicating an almost medium effect calculated for level of life threat

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Vlak voor dat dit proefschrift naar drukker ging berichtte de huisarts mij dat mijn kranige moeder van 81 die nog elke dag aan gymnastiek deed en zelfstandig leefde, kanker had. Twee dagen later waren we in het ziekenhuis en wilde men haar opnemen. Nog twee dagen later kreeg ze een bloedtransfusie, twee soorten antibiotica en nog 8 andere medicijnen terwijl ze voorheen slechts elke dag een kalktabletje slikte. Of mijn moeder over ruim anderhalve maand bij de verdediging van mijn proefschrift aanwezig kan zijn, kan de dokter vooralsnog niet beloven. Met haar avontuurlijke kant heeft zij mij in het leven aangezet stappen te nemen die ik eigenlijk niet durfde te nemen. Het nemen van risico's kan leiden tot onverwachte nieuwe dingen die niet voor mogelijk werden gehouden. Het avontuur dat een promotietraject inhoudt had ik niet zonder deze levensles kunnen aangaan. In dit dankwoord wil ik daarom als eerste mijn moeder bedanken. Daarnaast wil ik graag iedereen heel hartelijk bedanken die een bijdrage heeft geleverd aan de totstandkoming van dit proefschrift.

Curriculum Vitae

Thecla Brakel was born on July 15th, 1964 in Heemstede (the Netherlands). After working some time as a fashion designer she decided to study psychology part-time at the University of Groningen. Her master's thesis was about the satisfaction of cancer patients with their treatment in hospital. After completion of her study in 1996 she worked as a freelance data-analyst at the Department of Health Care Science, as an interviewer with cancer patients for a longitudinal research at the department of Social Psychology and as an entrepreneur she was setting up a course for women with eating problems. Next, she went to Göttingen (Germany) for several months of research at the Department of General Medicine. It was longitudinal research about the influence of different kinds of information methods on the prescription of medicine by general practitioners concerning asthma and urinary tract infections.

Thereafter she worked 7 years as a lecturer of the course "Medical Professional Education" at the Faculty of Medicine in Groningen (the Netherlands). At the same time she worked at Sosa INHOLLAND were she was teaching and developing lessons developmental psychology, creative education, and sports and games education. At the Noorderpoort college in Leek, Stadskanaal and Groningen she was working as a teacher with adults (welfare and English), people with learning disabilities (Dutch), young people at risk (biology, physics, chemistry, social studies, and creative training) and as a trajectory counselor with immigrants.

In 2007 she started to work on the PhD project entitled: "Evidence based development of patient education information to be provided through different media to increase quality of life in cancer patients", which was funded by KWF. She conducted her studies at the University of Groningen at the faculty of Behavioral and Social Sciences. On January 25th, 2012 she received the Snijders-Kouwer Award 2011 from the Heymans Institute for advanced psychological research and the best international scientific article written by a PhD student. This concerned her first article: " Impact of Social Comparison on Cancer survivors' Quality of Life: An Experimental Field Study", published in Health Psychology (doi:10.1037/a0026572).

In May 2011 as her PhD-position ended she started to work as a postdoctoral researcher/developer at the department of General Practice of the University Medical Center Groningen. She worked on the development of an automatic knowledge system which allowed different branches of allergy to be classified automatically. In three years this new service for general practitioners in the field of allergy diagnosis and treatment was developed. This was possible because after two years this work was awarded with an unrestricted grant by the private company ALKABELLÓ BV. She presented this and her earlier work at international conferences like the European Academy of Allergy and Clinical Immunology Congress and the European Health Psychology Society, respectively. In September 2011 she started additionally working as an added professor of psychology at the University of Groningen.

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